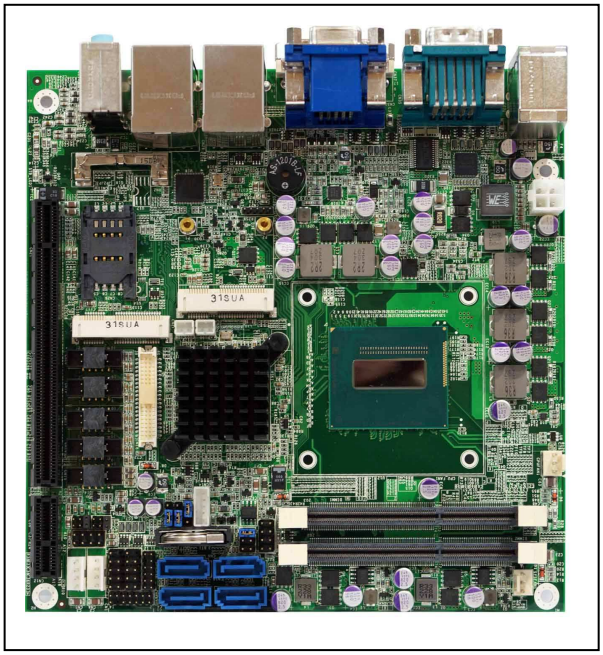
User Manual

MB-8301

Mini-ITX with onboard Intel® 4th generation Core™ i7/i5/i3/Celeron Mobile processor, Intel® QM87 chipset, DDR3 up to 16GB, 2 x Intel® Giga LAN, HDMI, DVI, VGA & LVDS, 4 x SATA, 10 x USB, 6 x COM, GPIO, HD Audio, PCI-Express X16 & X1 slots, 2 x Mini-PCIe, DC 8V ~ 32V input



Ver.	Release Date	Update
1.0V	2013.11.19	Release

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Packing list

Before use this product, please make sure that the following materials have been shipped.

- 1 x MB-8301 board
- 1 x SATA cable, L/ 200mm (p/n: 46L-SATA11-00)
- 1 x 12V/5V SATA power cable , L/ 150mm (p/n: 46L-IPOW41-00)
- 1 x CPU cooling Fan (p/n: 49L-F00050-00)
- 1 x CD Driver Utility

p/n: 46L-SATA11-00	p/n: 46L-IPOW41-00	p/n: 49L-F00050-00

Model Name	Description
MB-8301A-Q24	Mini-ITX w/ i7-4700EQ, 2 GLAN,HDMI/DVI/VGA/LVDS, COM, USB, Mini-PCIe socket, 4 SATA, 8V ~ 32V DC input, PCIe X16 slot
MB-8301A-D27	Mini-ITX w/ i5-4400E , 2 GLAN,HDMI/DVI/VGA/LVDS, COM, USB, Mini-PCIe socket, 4 SATA, 8V ~ 32V DC input, PCIe X16 slot
MB-8301A-D24	Mini-ITX w/ i3-4100E , 2 GLAN,HDMI/DVI/VGA/LVDS, COM, USB, Mini-PCIe socket, 4 SATA, 8V ~ 32V DC input, PCIe X16 slot
MB-8301A-D22	Mini-ITX w/ Celeron 2000E , 2 GLAN,HDMI/DVI/VGA/LVDS, COM Mini-PCIe socket, 4 SATA, 8V ~ 32V DC input, PCIe X16 slot
MB-8301B-Q24	Same as MB-830A-Q24, but come with, PCIe X16 & PCIe X1 slots
MB-8301B-D27	Same as MB-830A-D27, but come with, PCIe X16 & PCIe X1 slots
MB-8301B-D24	Same as MB-830A-D24, but come with, PCIe X16 & PCIe X1 slots
MB-8301B-D22	Same as MB-830A-D22, but come with, PCIe X16 & PCIe X1 slots

* If any of those items are missing or damaged, please contact with sales representative or distributor

Optional Accessory

Photo	Model Name
	P/N: RE-S01 PCIe riser card support 1 x PCIe X16 & 1 x PCI slots Note: Work with MB-8301B Series only
	P/N: RE-S02 PCIe riser card support 2 x PCI slots Note: Work with MB-8301B Series only
	P/N: RE-S03 PCIe riser card support 1 x PCIe X16 & 1 x PCIe X1 slots Note: Work with MB-8301B Series only
	P/N: 46L-ICOM38-00 Dual D-Sub 9-pin COM port card, L/ 250mm, with bracket
	P/N: 46L-IUSB07-AA Dual USB cable, L/ 250mm, with bracket
	P/N: 46L-IPOW102-00 P4 4-pin to DC Jack lockable power cable, L/ 200mm

Safety Information

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area.
- If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation Safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

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1.1 Introduction

MB-8301, a Mini-ITX board with onboard Intel® Haswell Mobile CPU with integrated Intel® QM87 Express chipset. Onboard display includes HDMI, DVI-D, VGA and 24-bit dual channel LVDS and two DDR3 SO-DIMM supports a maximum of 16GB DDR3 1600 of system memory.

MB-8301 delivers flexible expansion slots allowing customers to install one PCI-Express X16 card and two Mini-PCIe cards. It is built with a SIM card holder capable of installing a SIM card with a Full-size Mini-PCIe 3G module for wireless connection. For half-size Mini-PCIe socket it also supports mSATA SSD as storage device (Optional). Further more it comes with a PCI-Express X1 slot that can be paired with AEWIN's riser card for an additional 1 ~ 3 PCI slots for various application.

On the I/O ports, the MB-8301 provides plenty of connectivity. 1 x Intel® i211AT GbE LAN and 1 x Intel® i217LM controller, 1 x RS232/422/485 & 5 x RS232, 4 x USB3.0 + 6 x USB2.0, HD Audio, PS/2 Keyboard/Mouse, 4 x SATA with RAID 0/1/5/10 and a LPC pin-header supporting AEWIN's TPM module for the added information protection. The MB-8301 accepts a wide range 8V ~ 32V DC input suitable for a variety of applications in digital signage, industrial system, Military, POS, kiosks, and factory automation.

About AEWIN

AEWIN offers reliable and solid products which are produced under Management System Standards: ISO9001-2000 Certificate. The certificate keeps us focused on our quality objectives of management and environmental production. Its willingness to customize standard products for meet unique customer needs makes AEWIN different. All ODM projects are welcome. Years of experiences enables AEWIN to fulfill the customer's vision, by delivering products to exact specifications. AEWIN R&D team is proud of its strong engineering background. R&D professionals account for 25% of the AEWIN workforce. We focus on developing new products for both emerging and established markets

For more information about OEM/ODM, please contact us :
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1.2 Specification of board

System	
From Factor	Mini-ITX motherboard
CPU	Intel® Core™ i7-4700EQ, 2.4 GHz, Qual-Core / 6M L2, TDP 47W (**MB-8301A-Q24**) Intel® Core™ i5-4400E, 2.7 GHz, Dual-Core / 3M L2, TDP 37W (**MB-8301A-D27**) Intel® Core™ i3-4100E , 2.4 GHz, Dual-Core / 3M L2, TDP 35W (**MB-8301A-D24**)
Chipset	Intel QM87 Express chipset
Memory	2 x 204-pin DDR3 1333/1600 MHz / SODIMM up to 16GB, w/o ECC support
BIOS	AMI SPI BIOS
SSD	Half-size Mini-PCIe socket support mSATA SSD
Watchdog timer	255 levels, 1 ~ 255 sec
Expansion	1 x PCI-Express X16 slot 1 x PCI-Express X1 (work with riser card for PCIe X1 or PCI 32-bit/33 MHz expansion slots) 1 x Full-size Mini-PCIe socket w/ USB, PCIe signal 1 x Half-size Mini-PCIe socket w/ USB, PCIe or SATA signal
Board Size	170mm x 170mm
Operating Temp.	0°C~60°C (32°F~140°F)
Storage Temp.	.-20°C~80°C (-4°F~176°F)
Operating Hum.	10%~90% (non-condensing)

Display	
Chipset	Intel® haswell processor integrated
Display interface	1 x external HDMI 1.4a
	1 x external VGA
	1 x external DVI-D
	1 x internal 24-bit Dual Channel LVDS

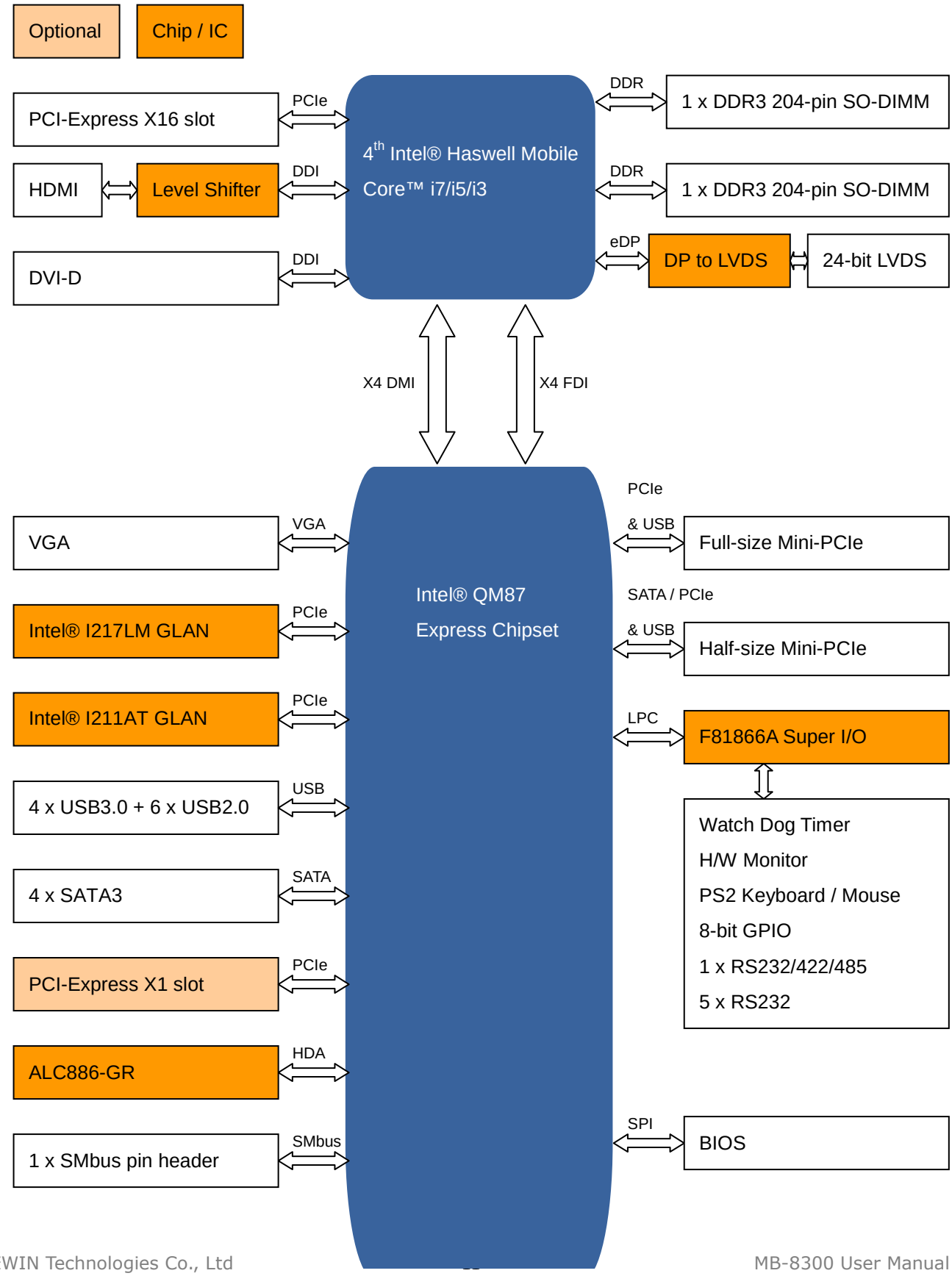
I/O	
Series Port	Internal : 1 x RS232/422/485 (COM2), 4 x RS232 External : 1 x RS232
SATA	4 x SATA 6Gb/s, w/ RAID 0/1/5/10
USB	External : 4 x USB3.0 + 2 x USB2.0 Internal : 4 x USB2.0
Ethernet	1 x Intel® i211AT PCIe controller

	1 x Intel® i217LM PHY support Intel® AMT 9.0
Audio	External : Line-in/out , Mic-in Internal : Line-out , Mic-in
Digital I/O	8-bit GPIO interface
LPC	1 x LPC 2 x 10-pin header for Optional TPM module
Others	2 x cooling Fan header (Smart fan support) , 1 x PS/2 keyboard/Mouse 1 x Front Panel header for power on/off, reset, HDD/power LED indicator 1 x LVDS Backlight/inverter pin-header

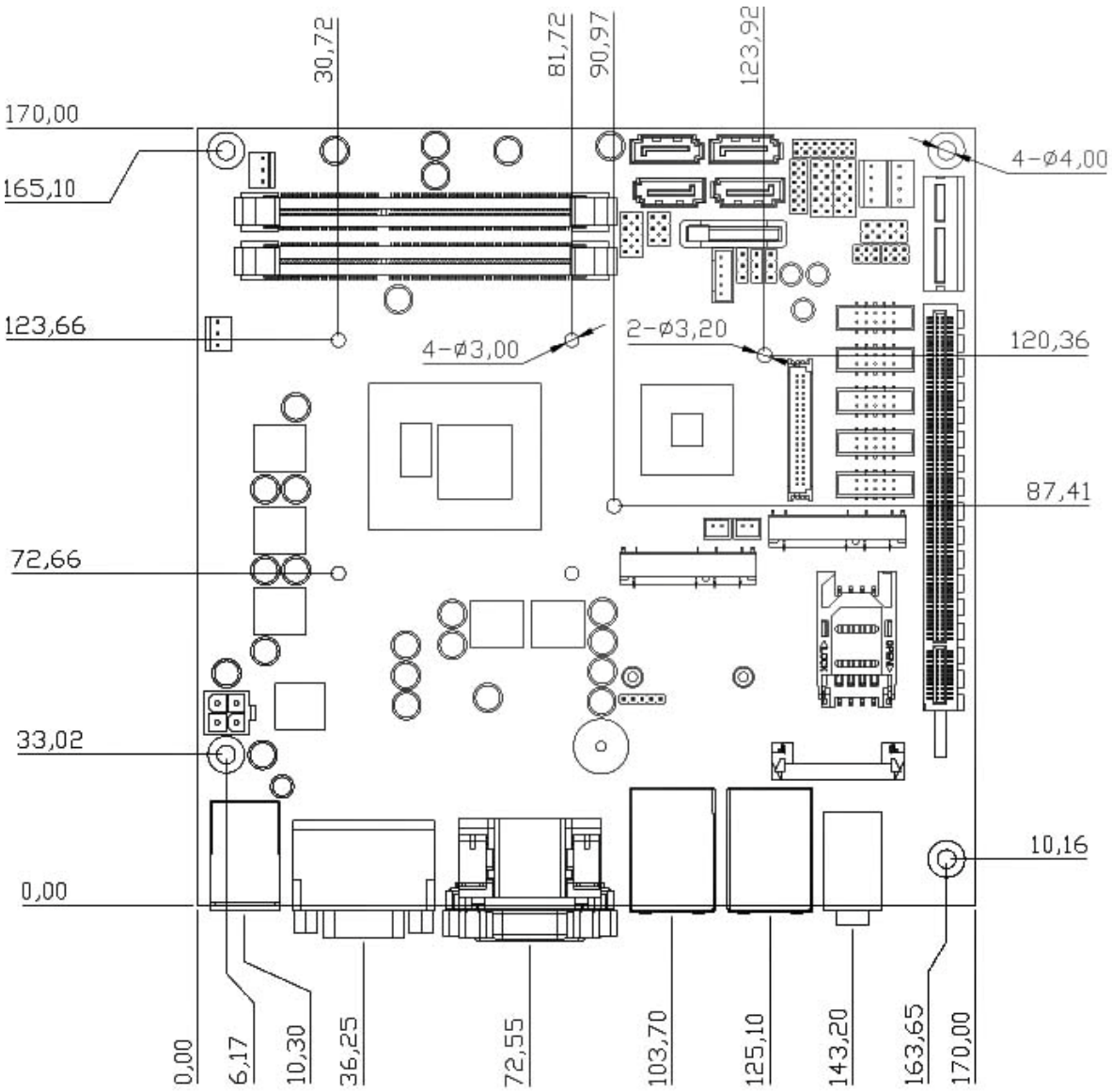
Power	
Power in	Wide range DC 8V ~ 32V input (AT/ATX mode select by jumper)
Connector	1 x internal P4 4-pin power connector

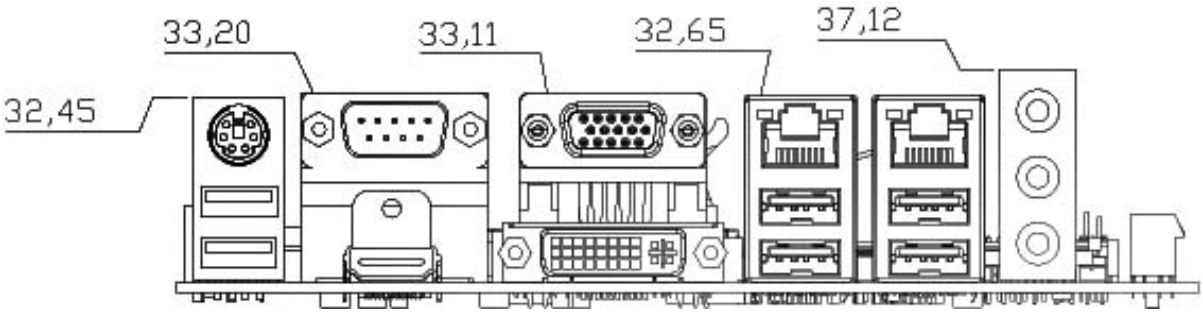
Note：All specifications and photos are subject to change without notice

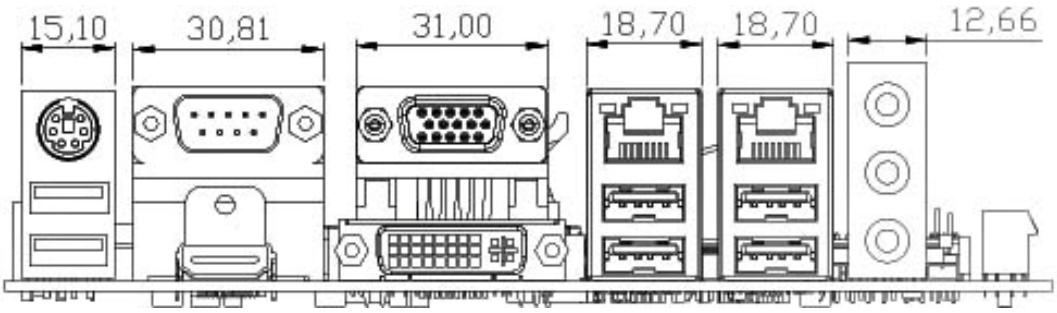
1.3 Block Diagram



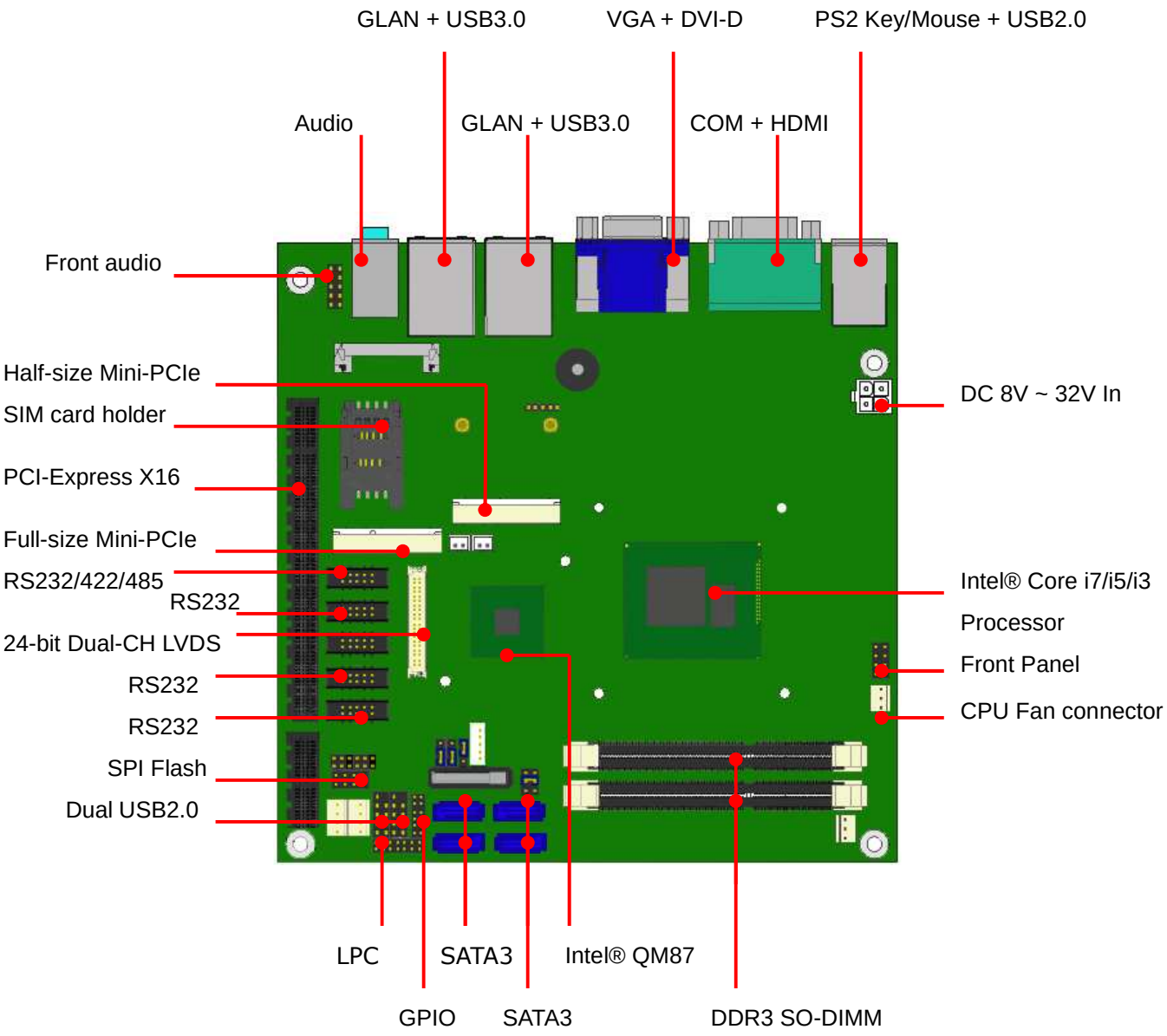
1.4 Board Layout Dimension

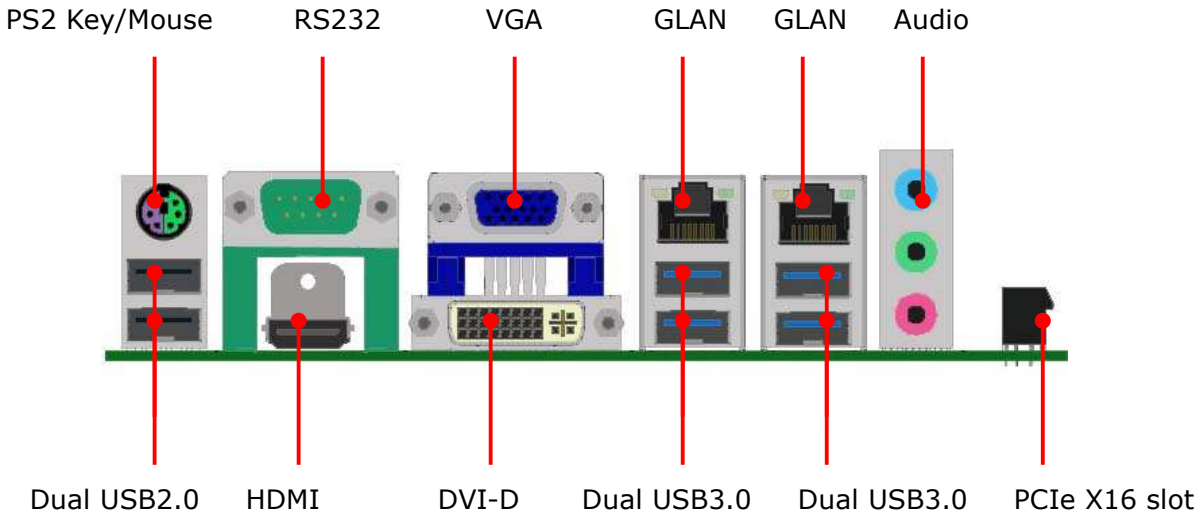



33,20
33,11
32,65
37,12
32,45

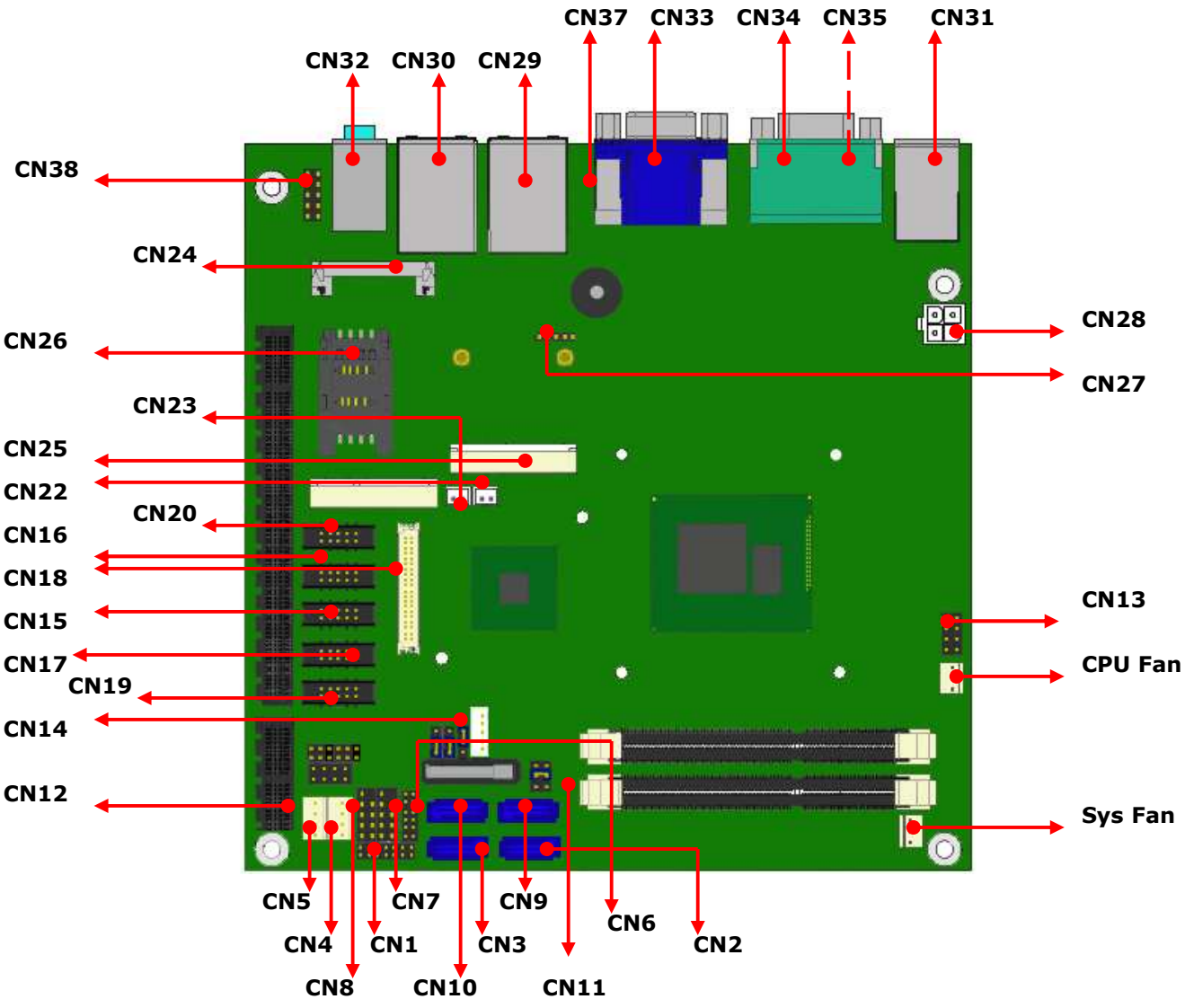

15,10
30,81
31,00
18,70
18,70
12,66

1.5 IO ports


GLAN + USB3.0
VGA + DVI-D
PS2 Key/Mouse + USB2.0
Audio
GLAN + USB3.0
COM + HDMI
Front audio
Half-size Mini-PCIe
SIM card holder
PCI-Express X16
Full-size Mini-PCIe
RS232/422/485
RS232
24-bit Dual-CH LVDS
RS232
RS232
SPI Flash
Dual USB2.0
DC 8V ~ 32V In
Intel® Core i7/i5/i3
Processor
Front Panel
CPU Fan connector
LPC
SATA3
Intel® QM87
GPIO
SATA3
DDR3 SO-DIMM


PS2 Key/Mouse
RS232
VGA
GLAN
GLAN
Audio
Dual USB2.0
HDMI
DVI-D
Dual USB3.0
Dual USB3.0
PCIe X16 slot

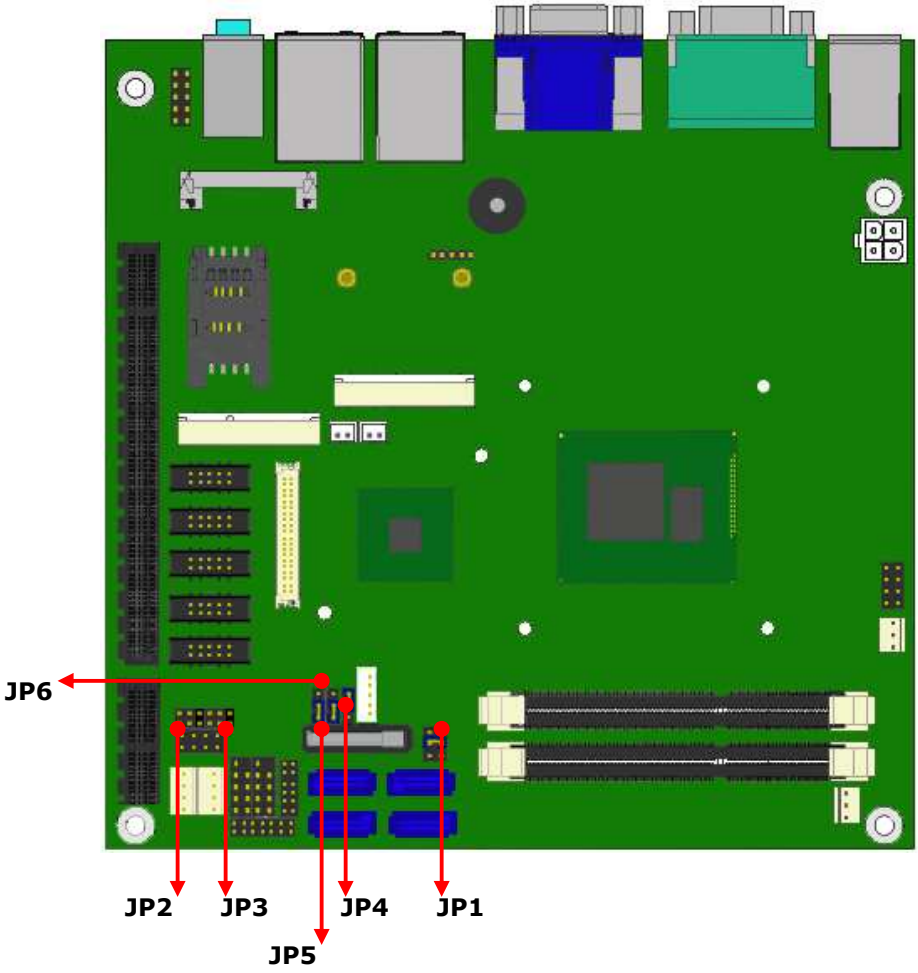
2.1 The location of onboard connectors



Label	Function
CN1	Low Pin Count
CN2	SATA3
CN3	SATA3
CN4	SATA power
CN5	SATA power
CN6	GPIO
CN7	USB 2.0 Pin header
CN8	USB 2.0 Pin header
CN9	SATA3
CN10	SATA3
CN11	SPI Programmer
CN12	PCI-Express X1 slot
CN13	Power on/off, Reset, HDD/Power LED
CN14	LVDS backlight inverter
CN15	COM4
CN16	COM3
CN17	COM5
CN18	24-bit LVDS
CN19	COM6
CN20	COM2
CN21	PCI-Express X16 slot

Label	Function
CN22	Half-size Mini-PCIe LED
CN23	Full-size Mini-PCIe LED
CN24	Full-size Mini-PCIe socket
CN25	Half-size Mini-PCIe socket
CN26	SIM card holder
CN27	SMBUS pin header
CN28	P4 4-pin power input connector
CN29	RJ45 LAN + Dual USB 3.0
CN30	RJ45 LAN + Dual USB 3.0
CN31	PS2 keyboard/mouse + Dual USB 2.0
CN32	Audio jack
CN33	VGA connector
CN34	COM1
CN35	HDMI connector
CN36	N/C
CN37	DVI-D connector
CN38	Front Audio header
CN39	N/C
CN40	N/C
CN41	N/C
CN42	N/C

2.2 The location of onboard jumpers



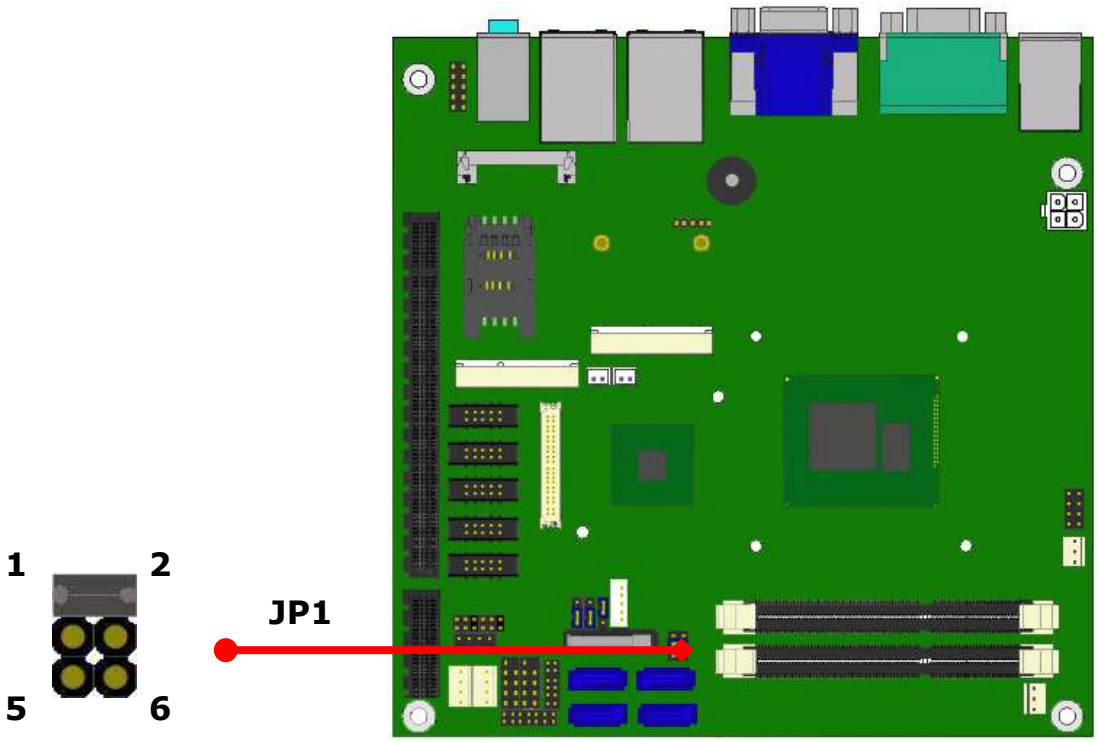
Label	Function
JP1	Panel Voltage (VCC) select
JP2	COM3 Pin-9 select mode (RI/5V/12V)
JP3	COM4 Pin-9 select mode (RI/5V/12V)
JP4	LVDS backlight control mode select
JP5	CMOS Clear jumper
JP6	AT/ATX power mode jumper select

2.3 The function list of onboard jumpers setting

- 2.3.1 : JP1 for Panel Voltage select

JP1	
Closed Pin	Result
1-2 *	+3.3V
3-4	+5V
5-6	+12V

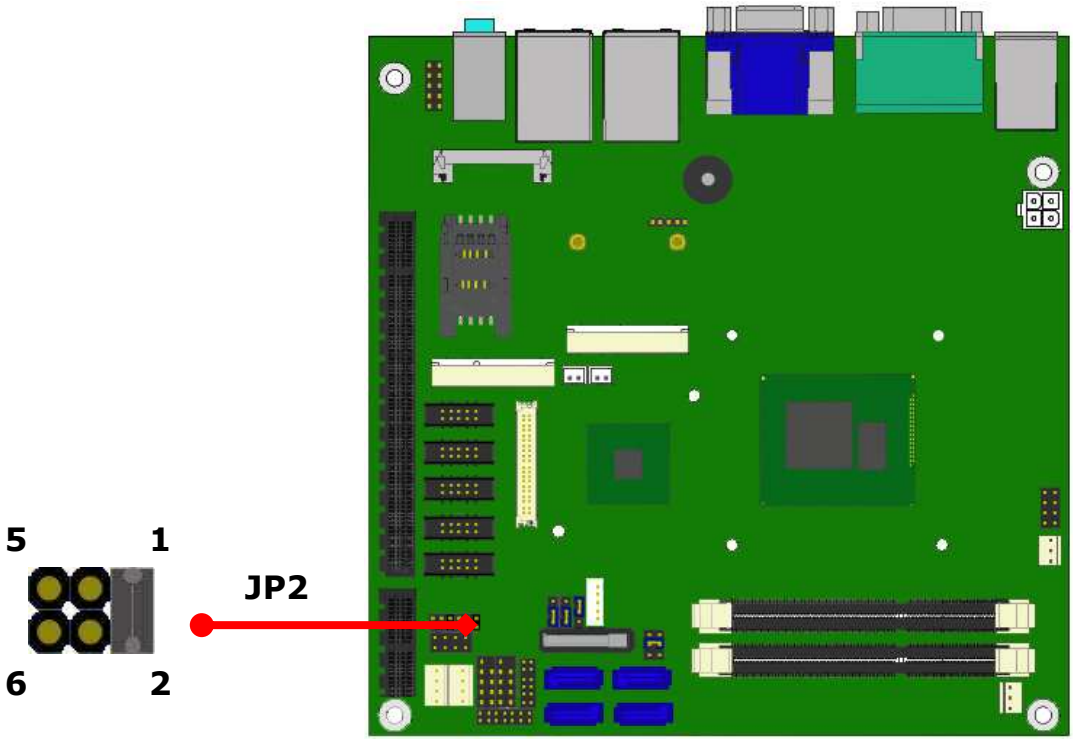
* Default setting



- 2.3.2: JP2 for COM3 box header Pin-8 function select

JP2	
Closed Pin	Result
1-2 *	RI
3-4	+5V
5-6	+12V

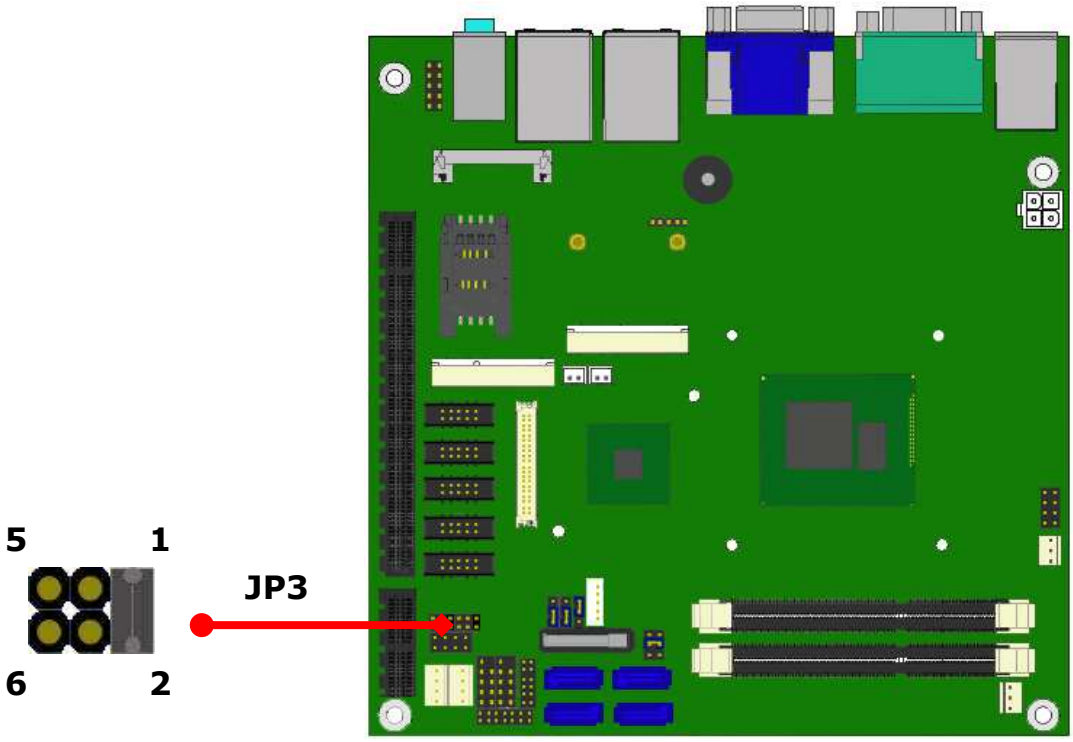
* Default setting



- 2.3.3: JP3 for COM4 box header Pin-8 function select

JP3	
Closed Pin	Result
1-2 *	RI
3-4	+5V
5-6	+12V

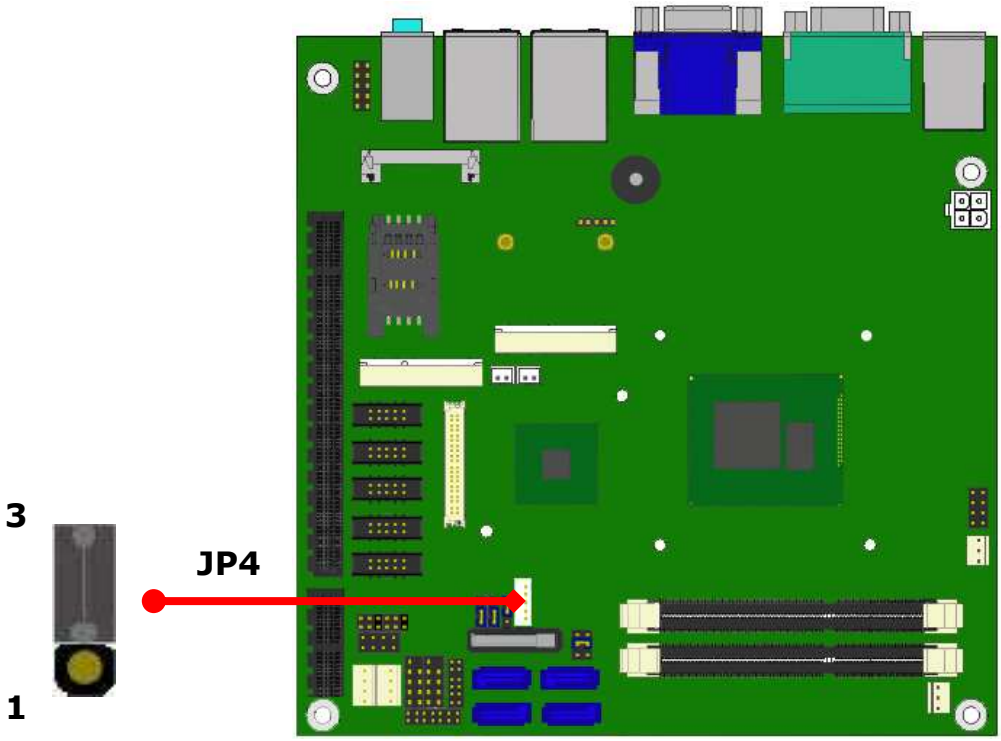
* Default setting



- 2.3.4 : JP4 for LVDS brightness control mode

JP4	
Closed Pin	Result
1-2	PWM mode
2-3 *	DC Level

* Default setting

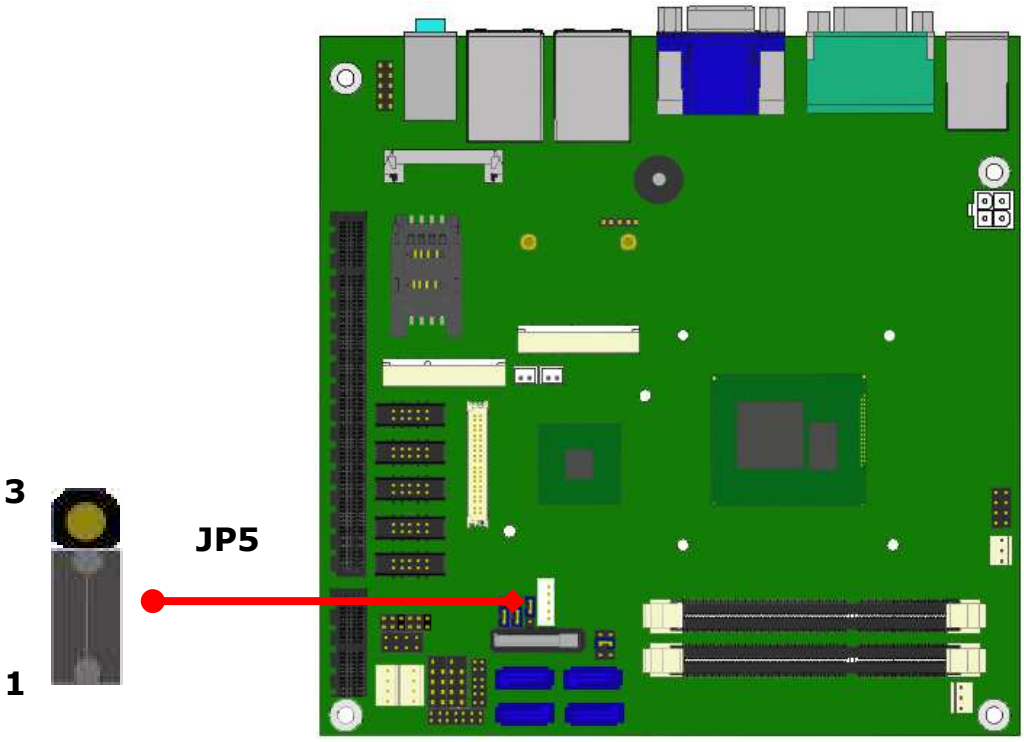


- 2.3.1 : JP5 for Clear CMOS

If you want to clean the CMOS data, set jumper to 2-3 just for few seconds, Then, Move the jumper back to 1-2 pin

JP5	
Closed Pin	Result
1-2 *	Normal
2-3	Clear CMOS

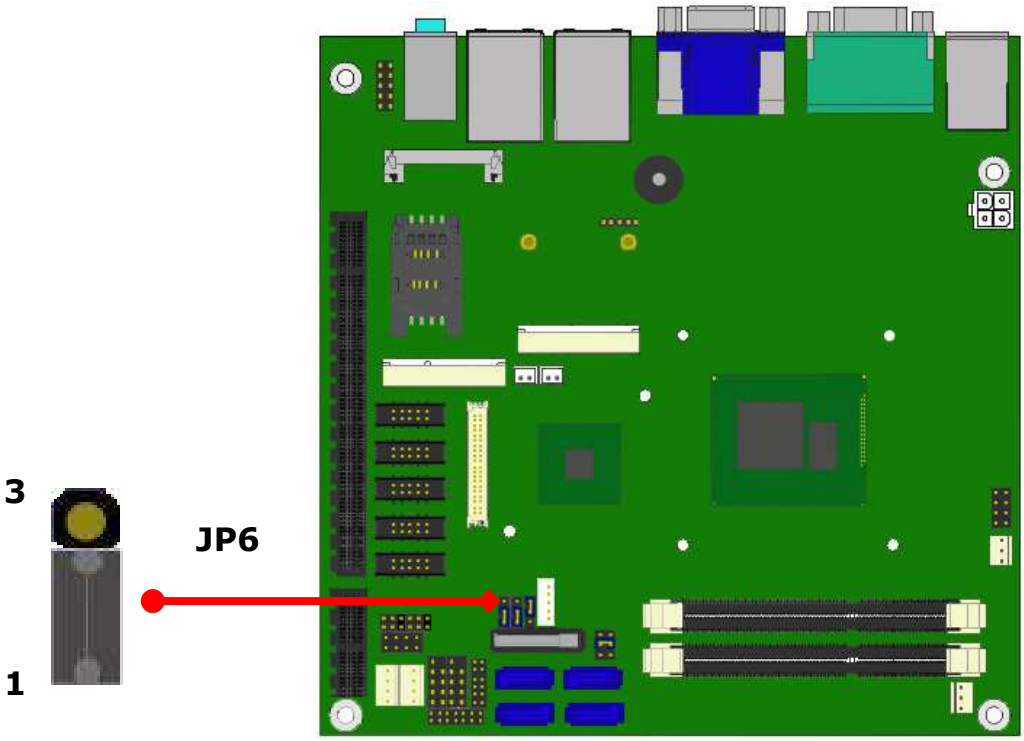
* Default setting



- 2.3.2: JP6 for ATX / AT mode

JP6	
Closed Pin	Result
1-2 *	ATX mode
2-3	AT mode

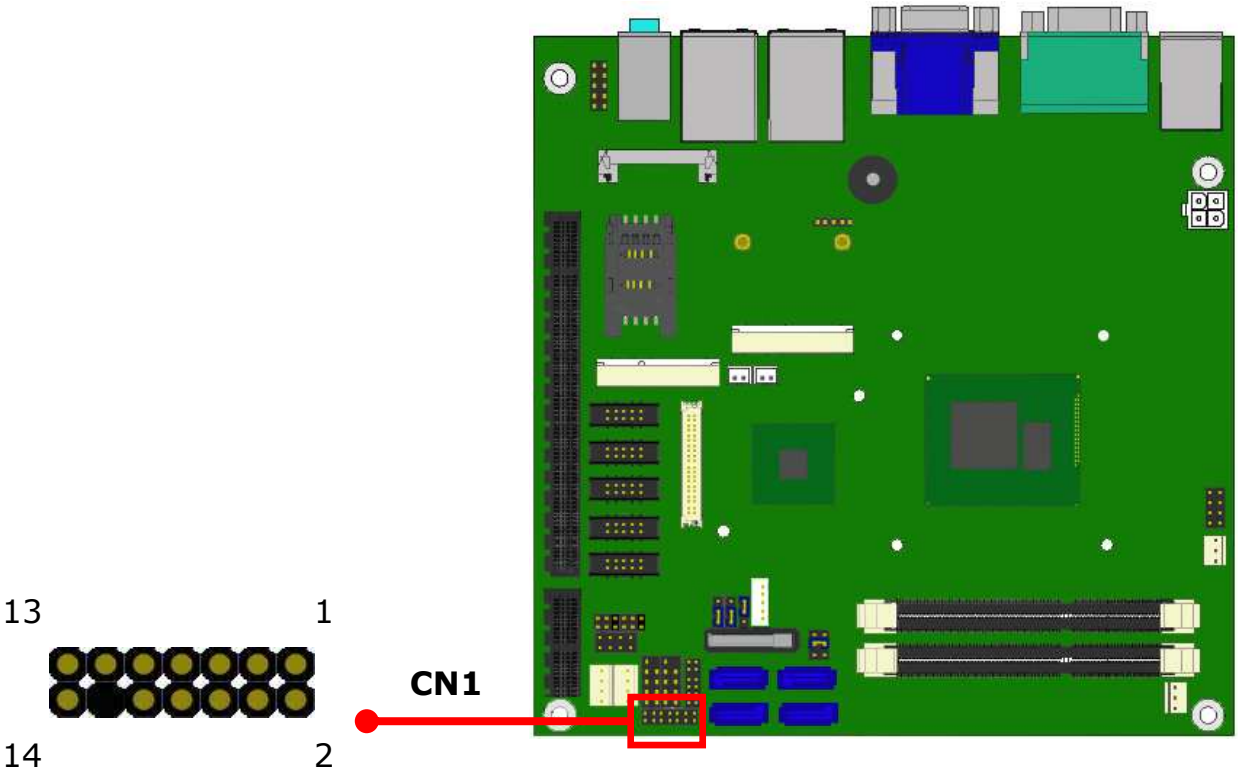
* Default setting



2.4 The pin define of onboard pin header

- 2.4.1 : CN1 for Low Pin Count pin-header

CN1 : 2 x 7 header , pitch 2.0 mm			
Pin	**Signal**	**Pin**	**Signal**
1	+3.3V	2	LAD0
3	LAD1	4	LAD2
5	LAD3	6	LFRAME
7	Reset	8	+5V
9	LCLK	10	LPME
11	GND		Key
13	SERIRQ	14	LDRQ



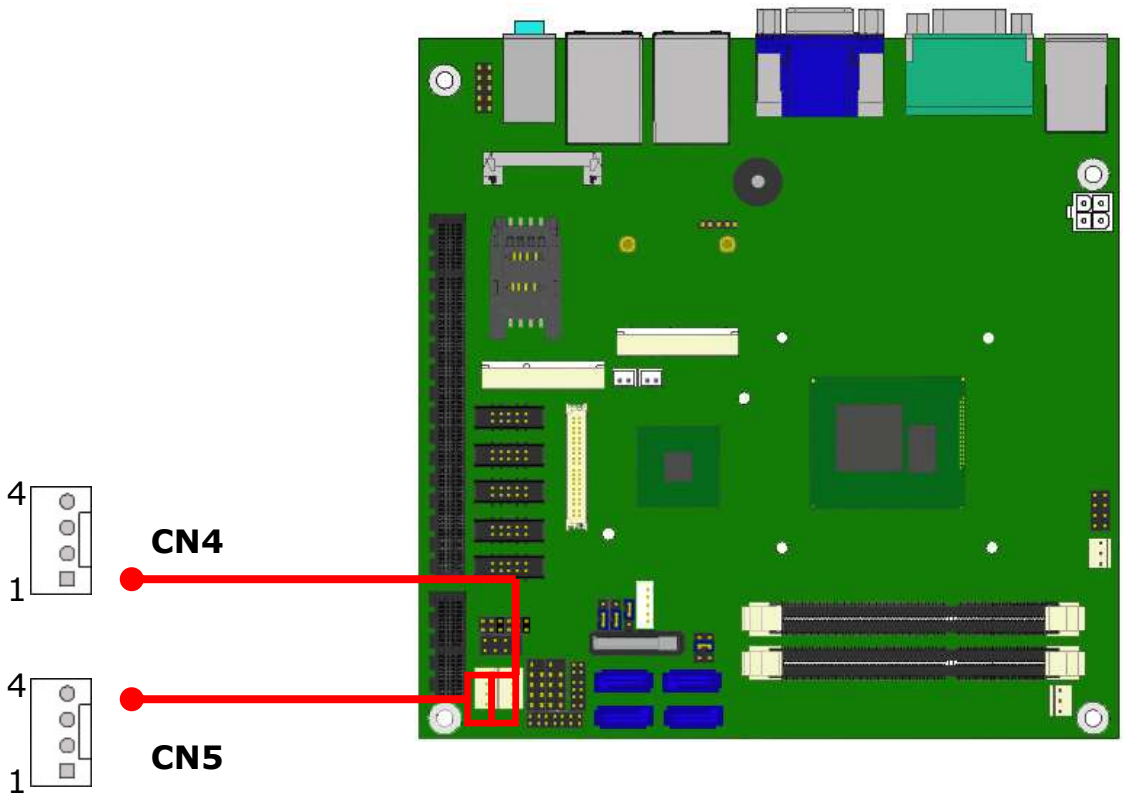
- 2.4.2 : CN4 & CN5 for 4-pin HDD power

CN4 : 4-pin wafer for SATA power connector			
Pin	**Signal**	**Pin**	**Signal**
1	+12V	2	GND
3	GND	4	+5V

Note: Maximum output current 12V/1A, 5V/1A

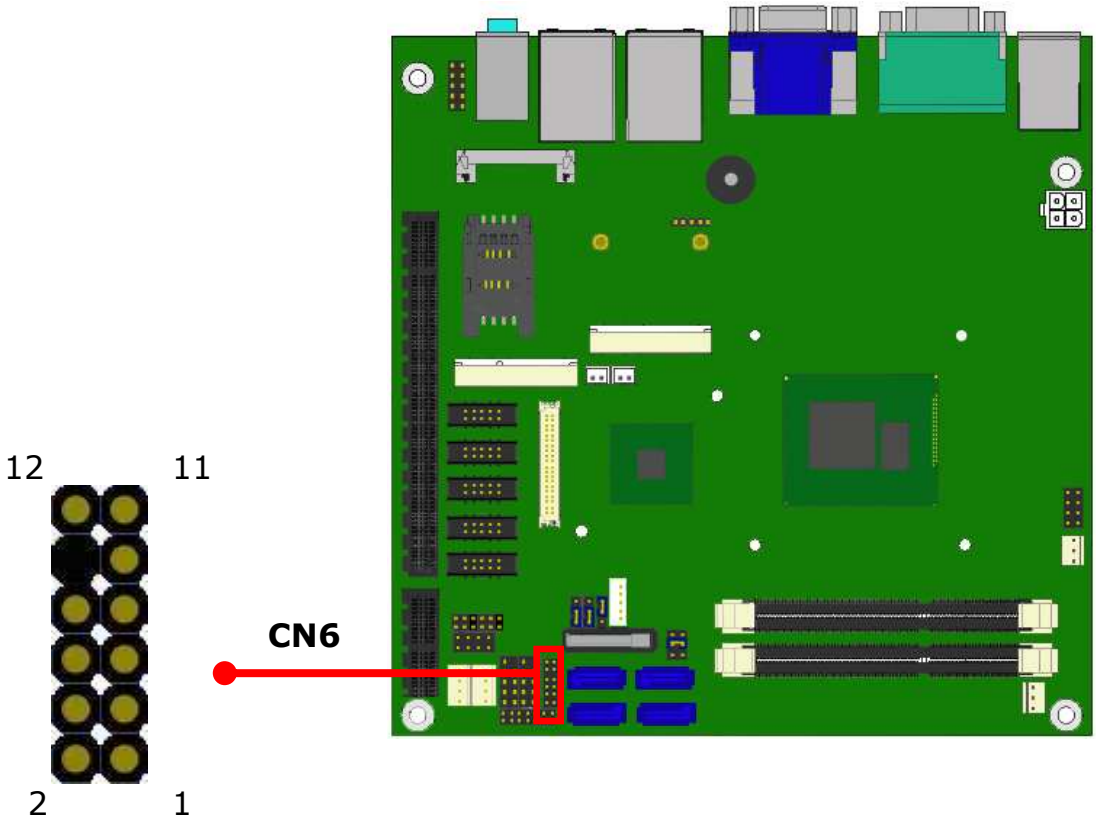
CN5 : 4-pin wafer for SATA power connector			
Pin	**Signal**	**Pin**	**Signal**
1	+12V	2	GND
3	GND	4	+5V

Note: Maximum output current 12V/1A, 5V/1A



2.4.3 : CN6 for 8-bit GPIO

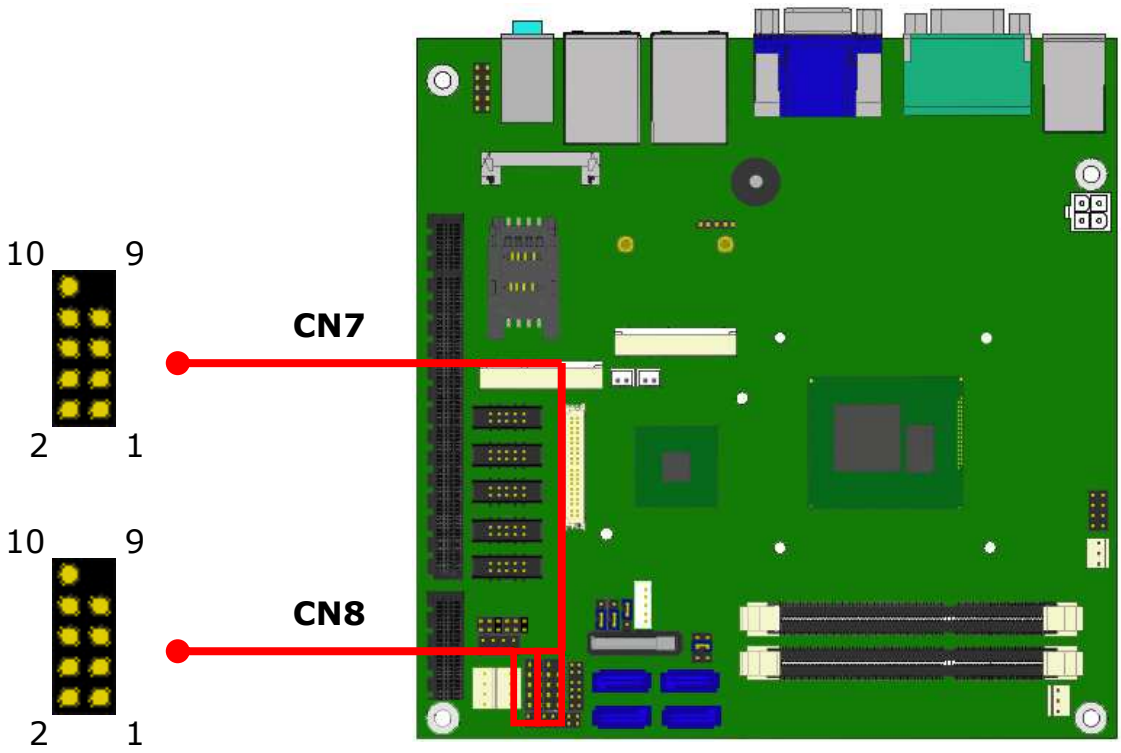
CN6 : 2 x 6 header , pitch 2.0 mm			
Pin	**Signal**	**Pin**	**Signal**
1	+3.3V	2	GPIO0
3	GPIO1	4	GPIO2
5	GPIO3	6	GPIO4
7	GPIO5	8	GPIO6
9	GPIO7	10	Key
11	+5V	12	GND



- 2.4.4 : CN7 & CN8 for USB 6/7 , USB 8/9

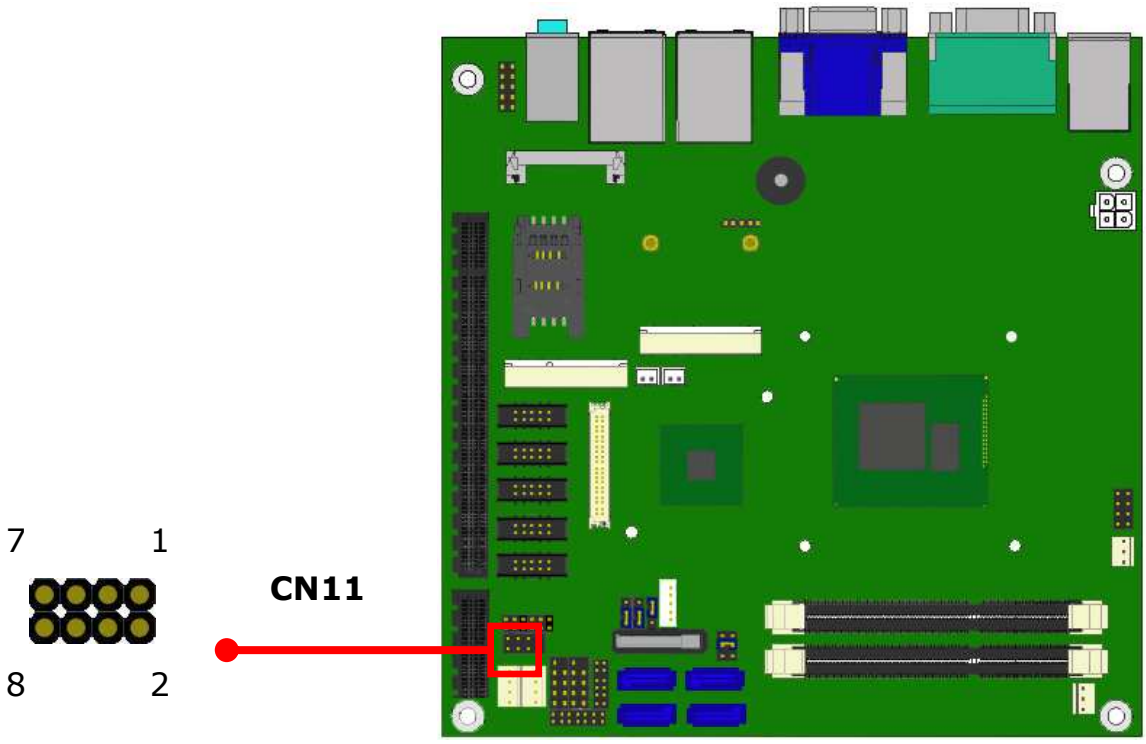
CN7: 2 x 5 header , pitch 2.54 mm			
Pin	**Signal**	**Pin**	**Signal**
1	+5V	2	+5V
3	USB6_ data-	4	USB7_data-
5	USB6_ data+	6	USB7_data+
7	GND	8	GND
9	Key	10	GND

CN8: 2 x 5 header , pitch 2.54 mm			
Pin	**Signal**	**Pin**	**Signal**
1	+5V	2	+5V
3	USB8_ data-	4	USB9_data-
5	USB8_ data+	6	USB9_data+
7	GND	8	GND
9	Key	10	GND



- 2.4.5 : CN11 for SPI programmer

CN11 : 2 x 4 header , pitch 2.54 mm			
Pin	**Signal**	**Pin**	**Signal**
1	+3.3V	2	GND
3	CS_N (Chip Select)	4	SCLK (Serial Clock)
5	MISO (Master Input, Slave Output)	6	MOSI (Master Output, Slave Input)
7	N/C	8	FLASH_IO

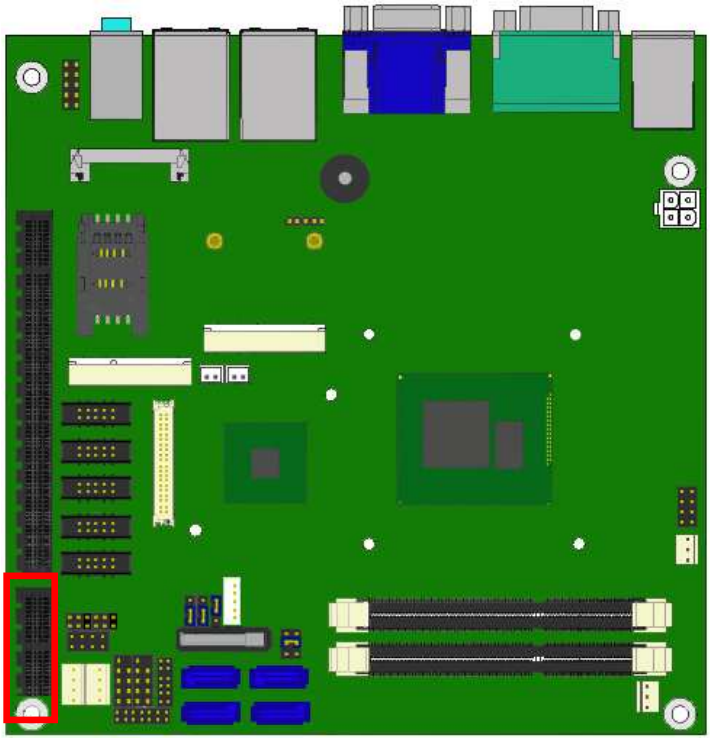


- 2.4.6 : CN12 for PCI-Express X1 slot

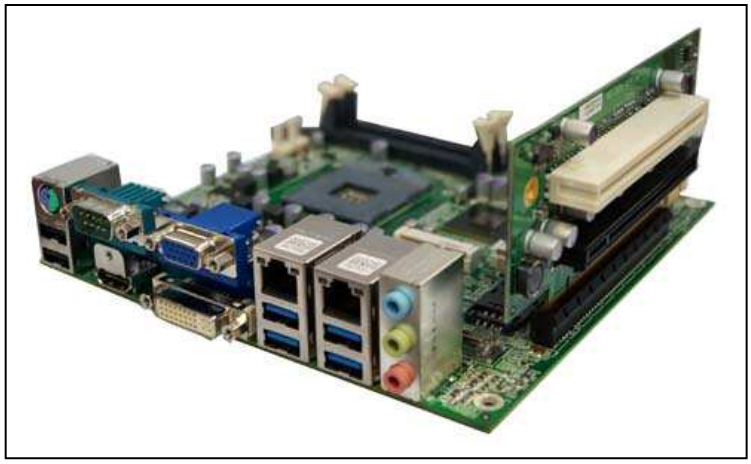
Note: This slot could work with AEWIN's RE-S0X riser card to get PCIe X16 & PCI expansion slots

Regarding the PCIe X16 slot, The Max. power that could support is 35W PCIe add-on card

Pin	Side B	Side A
1	+12V	PRSNT1
2	+12V	+12V
3	+12V	+12V
4	GND	GND
5	SMCLK	TCK
6	SMDAT	TDI
7	GND	TOD
8	+3.3V	TMS
9	RST	+3.3V
10	+3.3V AUX	+3.3V
11	WAKE	PWRGD
	Key Notch	
12	Reserved	GND
13	GND	REFCLK+
14	HSOp	REFCLK-
15	HSOn	GND
16	GND	HSIp
17	PRSNT2	HSIn
18	GND	GND

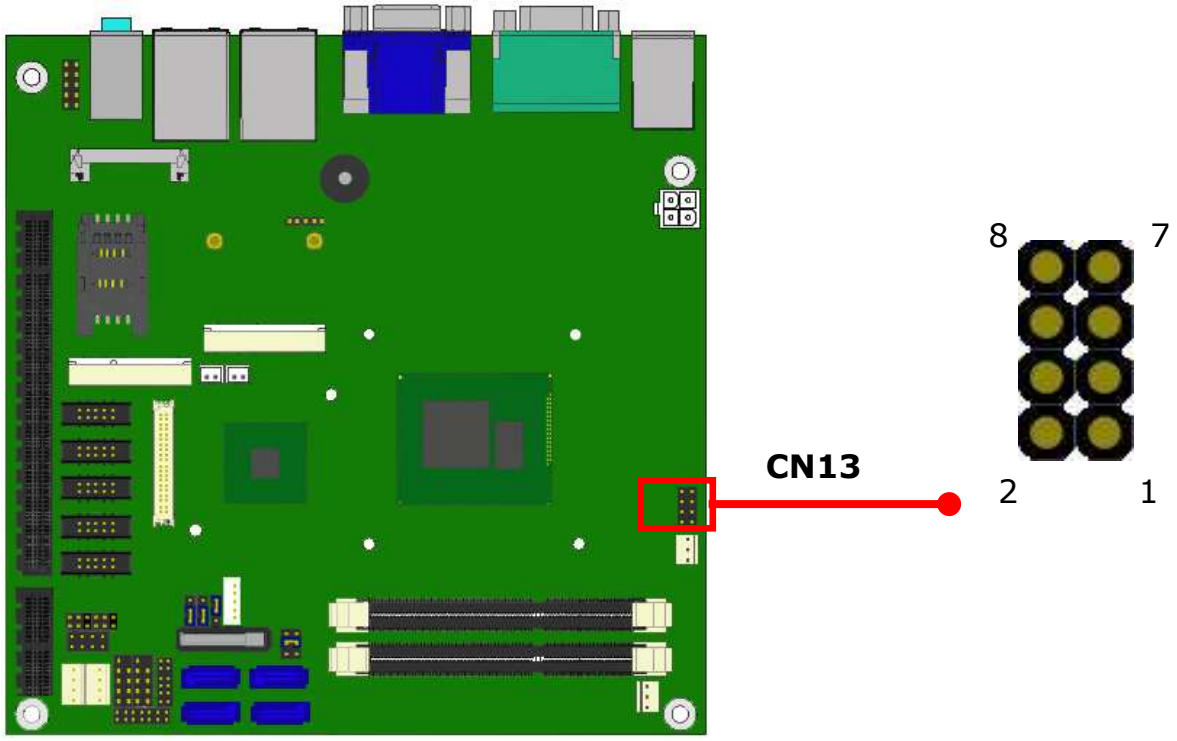


Configuration of MB-8300C with RE-S01 riser card



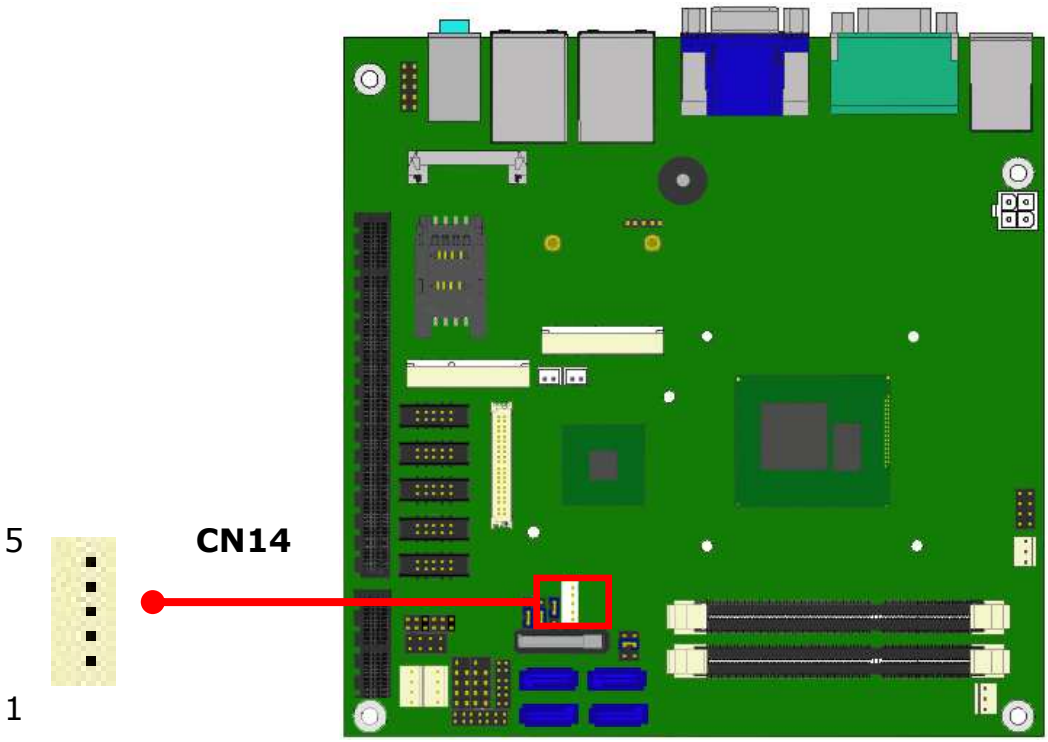
- 2.4.7 : CN13 for Front panel

CN13 : 2 x 4 header , pitch 2.54 mm			
Pin	**Signal**	**Pin**	**Signal**
1	HDD_LED+	2	Power_LED+
3	HDD_LED-	4	GND
5	GND	6	GND
7	RESET+	8	Power Switch



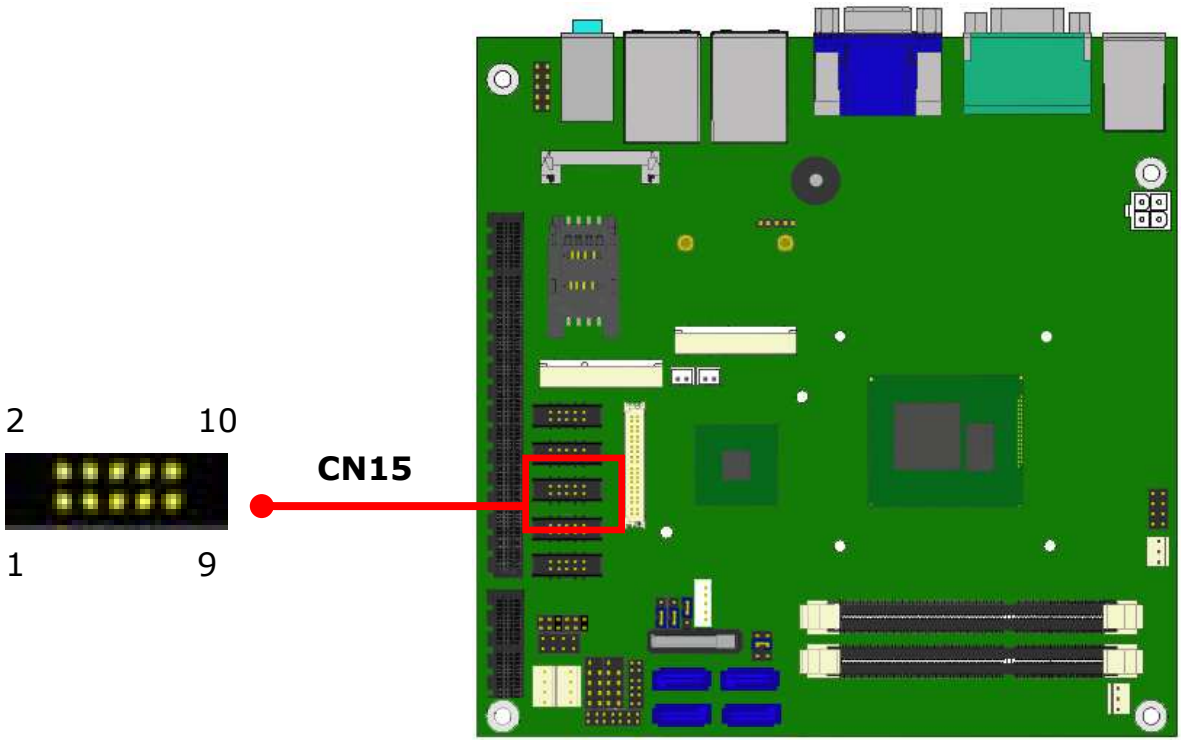
- 2.4.8 : CN14 for LVDS Backlight pin header

CN14: 1 x 5 wafer , Pitch : Pitch 2.0 mm			
Pin	**Signal**	**Pin**	**Signal**
1	+12V	2	GND
3	Backlight Enable	4	Backlight Control
5	+5V		



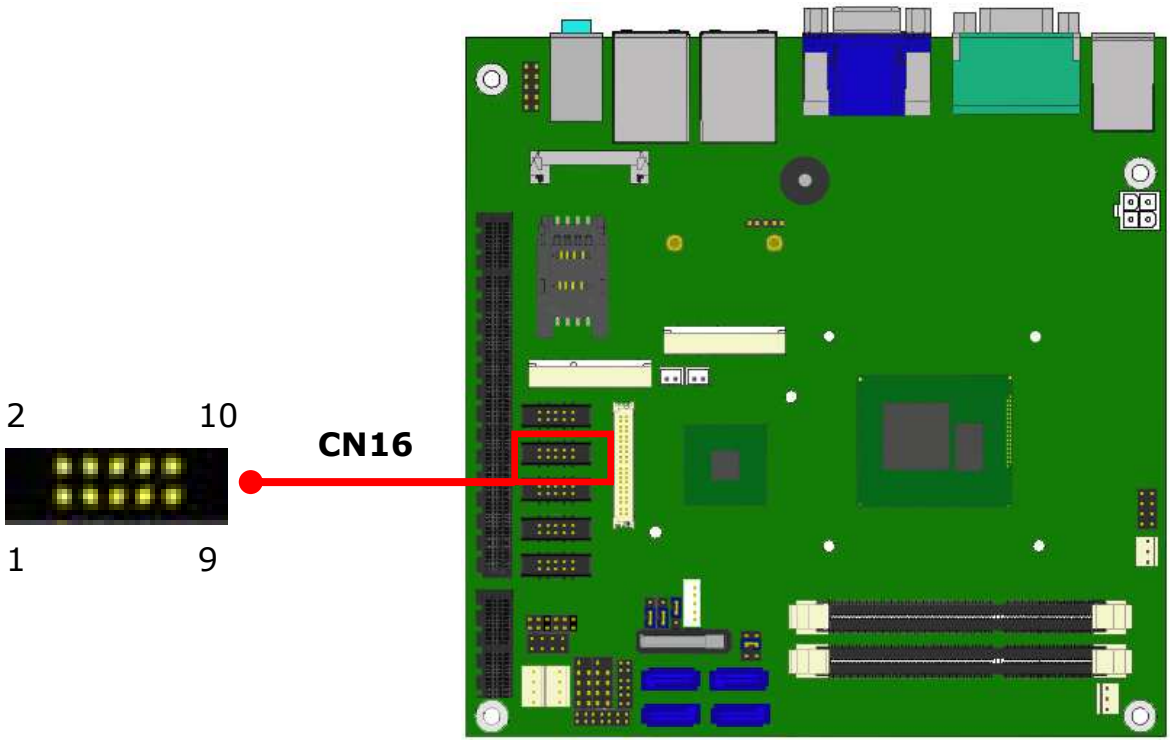
- 2.4.9 : CN15 for COM4 box header

CN15 : 2 x 5 header, pitch 2.00 mm			
Pin	**Signal**	**Pin**	**Signal**
1	DCD, Data carrier detect	2	DSR, Data set ready
3	RXD, Receive Data	4	RTS, Request to send
5	TXD, Send Data	6	CTS, Clear to se
7	DTR, Data Terminal Ready	8	RI, Ring indicator
9	GND	10	N/C



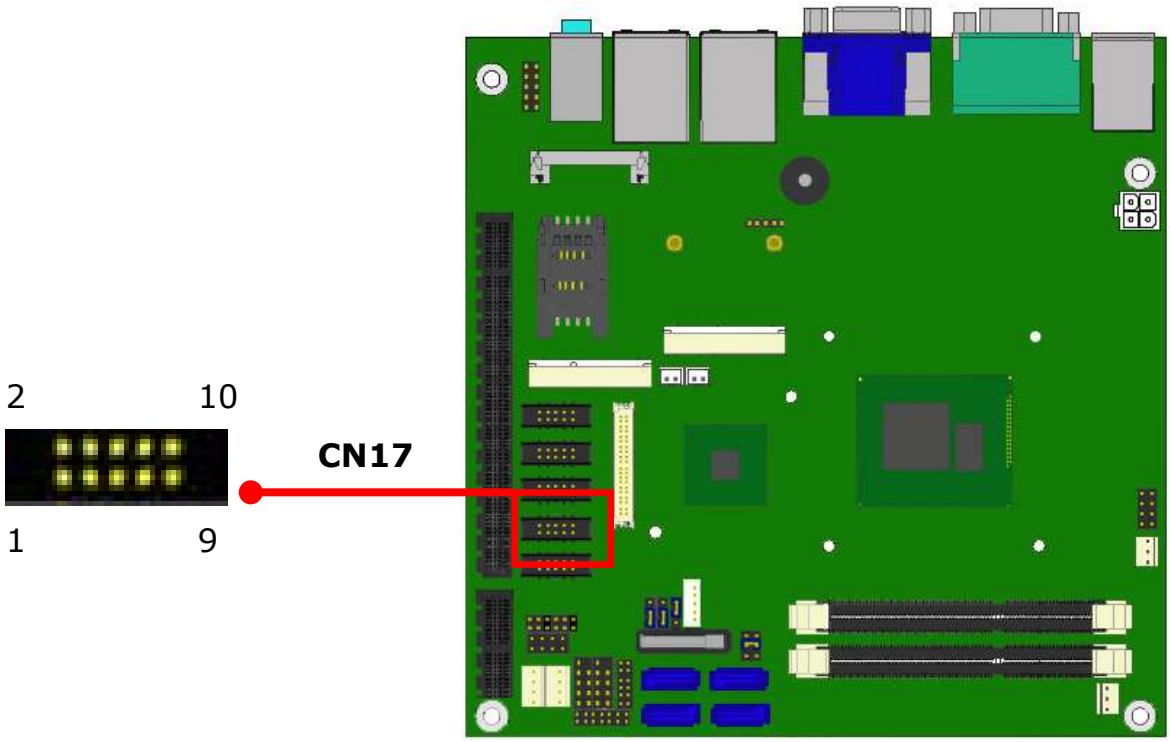
- 2.4.10 : CN16 for COM3 box header

CN16 : 2 x 5 header, pitch 2.00 mm			
Pin	**Signal**	**Pin**	**Signal**
1	DCD, Data carrier detect	2	DSR, Data set ready
3	RXD, Receive Data	4	RTS, Request to send
5	TXD, Send Data	6	CTS, Clear to se
7	DTR, Data Terminal Ready	8	RI, Ring indicator
9	GND	10	N/C



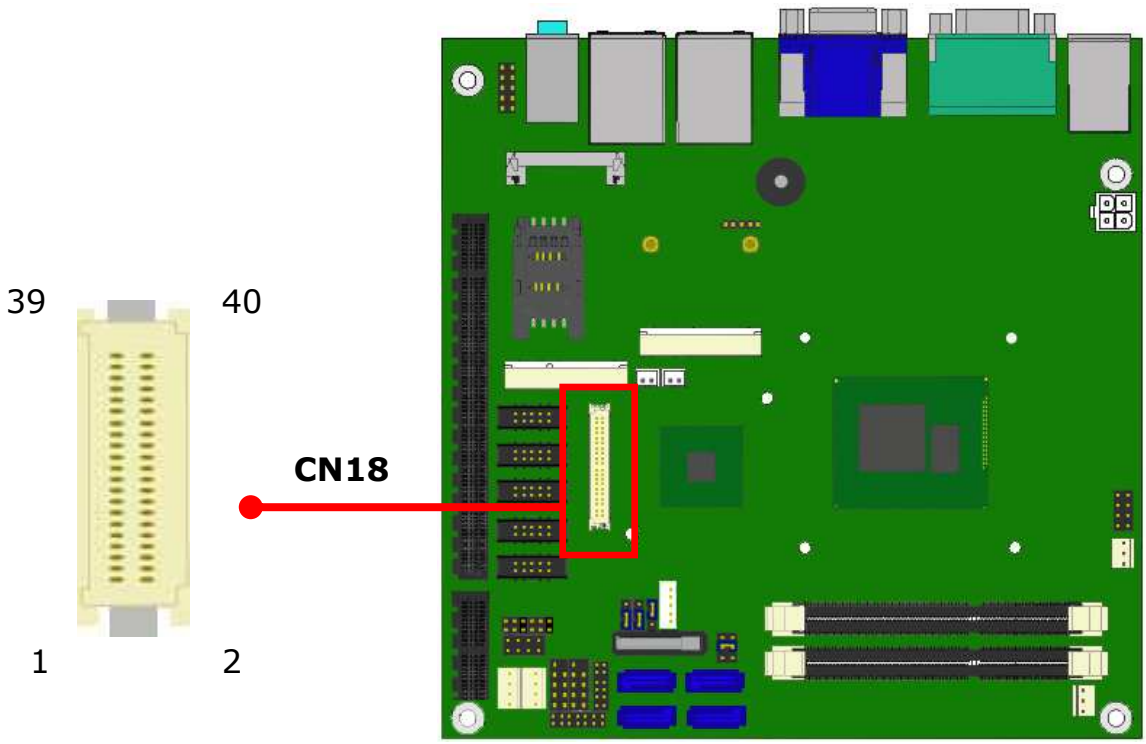
- 2.4.11 : CN17 for COM5 box header

CN17 : 2 x 5 header, pitch 2.00 mm			
Pin	**Signal**	**Pin**	**Signal**
1	DCD, Data carrier detect	2	DSR, Data set ready
3	RXD, Receive Data	4	RTS, Request to send
5	TXD, Send Data	6	CTS, Clear to se
7	DTR, Data Terminal Ready	8	RI, Ring indicator
9	GND	10	N/C



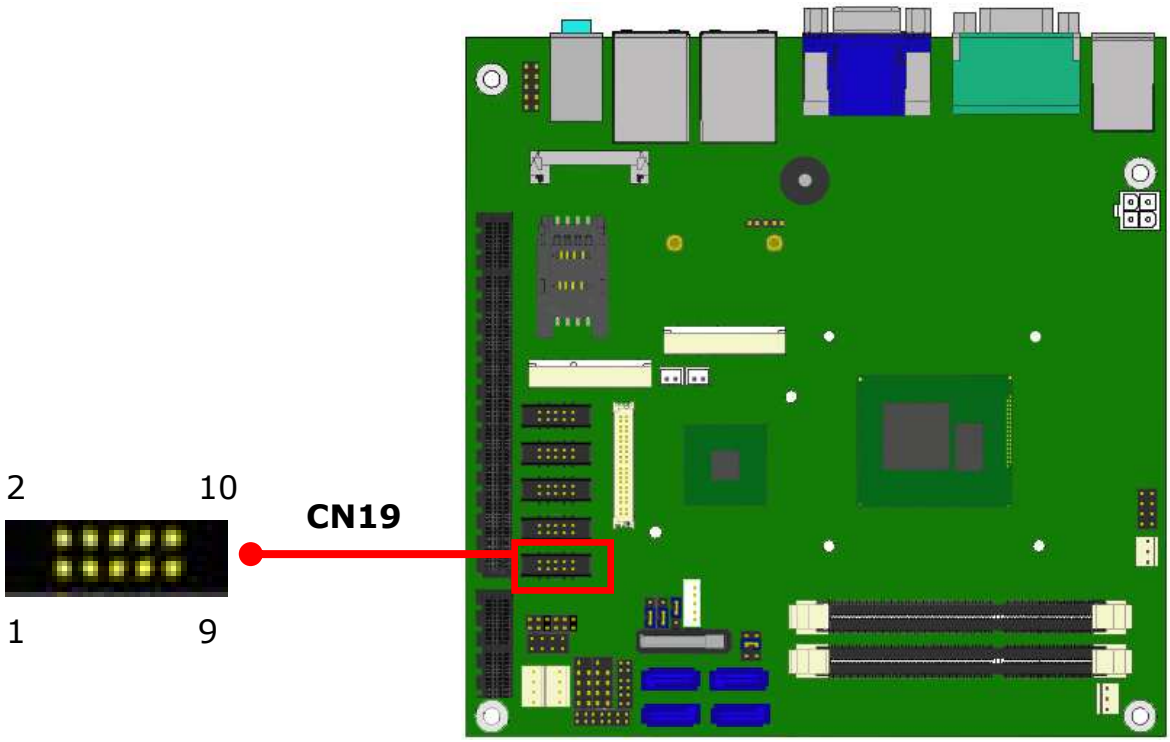
- 2.4.12 : CN18 for 24-bit Dual Channel LVDS

CN18 : connector type : DF13A-40DP-1.25V					
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
1	LVDS_VCC	15	LVDSA_1+	29	GND
2	LVDS_VCC	16	LVDSB_1+	30	GND
3	LVDS_VCC	17	GND	31	DDC_Clock
4	LVDS_VCC	18	GND	32	DDC_Data
5	GND	19	LVDSA_2-	33	GND
6	GND	20	LVDSB_2-	34	GND
7	LVDSA_0-	21	LVDSA_2+	35	LVDSA_3-
8	LVDSB_0-	22	LVDSB_2+	36	LVDSB_3-
9	LVDSA_0+	23	GND	37	LVDSA_3+
10	LVDSB_0+	24	GND	38	LVDSB_3+
11	GND	25	LVDSA_Clock-	39	SMB_Clock
12	GND	26	LVDSB_Clock-	40	SMB_Data
13	LVDSA_1-	27	LVDSA_Clock+		
14	LVDSB_1-	28	LVDSB_Clock+		



- 2.4.13 : CN19 for COM6 box header

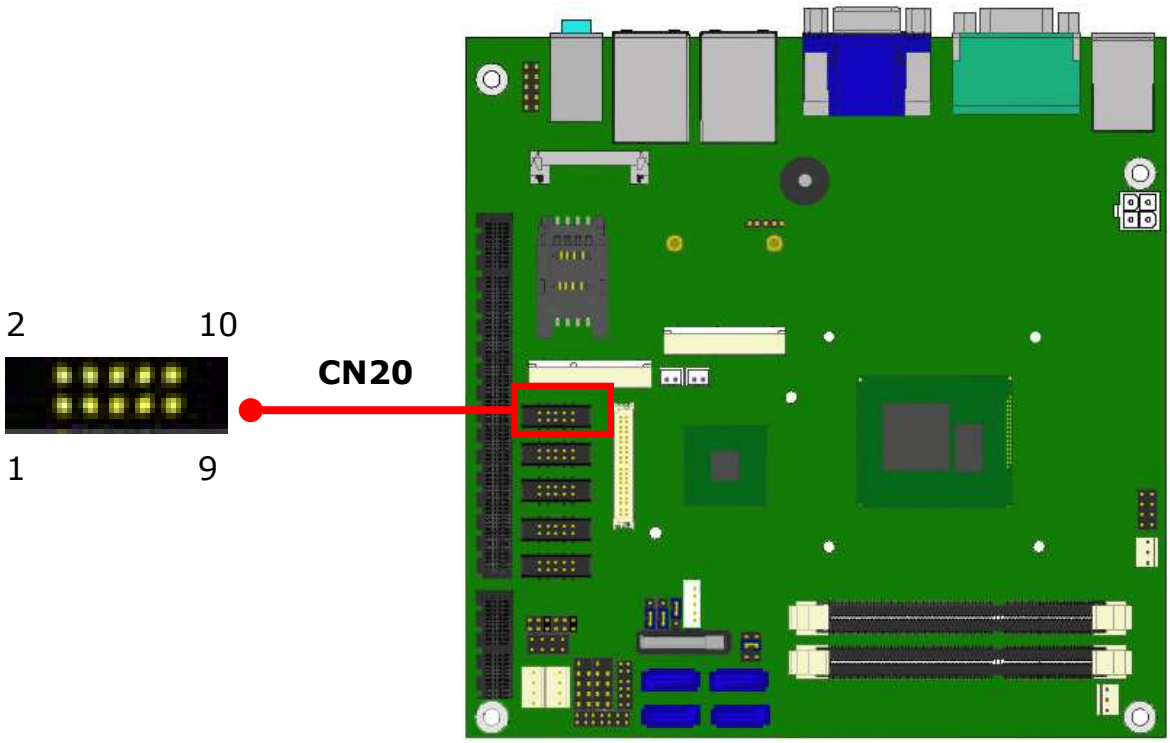
CN19 : 2 x 5 header, pitch 2.00 mm			
Pin	**Signal**	**Pin**	**Signal**
1	DCD, Data carrier detect	2	DSR, Data set ready
3	RXD, Receive Data	4	RTS, Request to send
5	TXD, Send Data	6	CTS, Clear to se
7	DTR, Data Terminal Ready	8	RI, Ring indicator
9	GND	10	N/C



- 2.4.14 : CN20 for COM2 , RS232/422/485

Note: COM2 RS-232/422/485 can be set by BIOS setting. Default is RS-232.

CN20 : 2 x 5 header , Pitch 2.00 mm			
Pin	**RS232 mode**	**RS422 mode**	**RS485 mode**
1	DCD, Data carrier detect	TXD-	TXD-
2	DSR, Data set ready		
3	RXD, Received Data	TXD+	TXD+
4	RTS, Request to send		
5	TXD, Transmitted Data	RXD+	
6	CTS, Clear to sent		
7	DTR, Data terminal ready	RXD-	
8	RI, Ring indicator		
9	GND		
10	N/C		

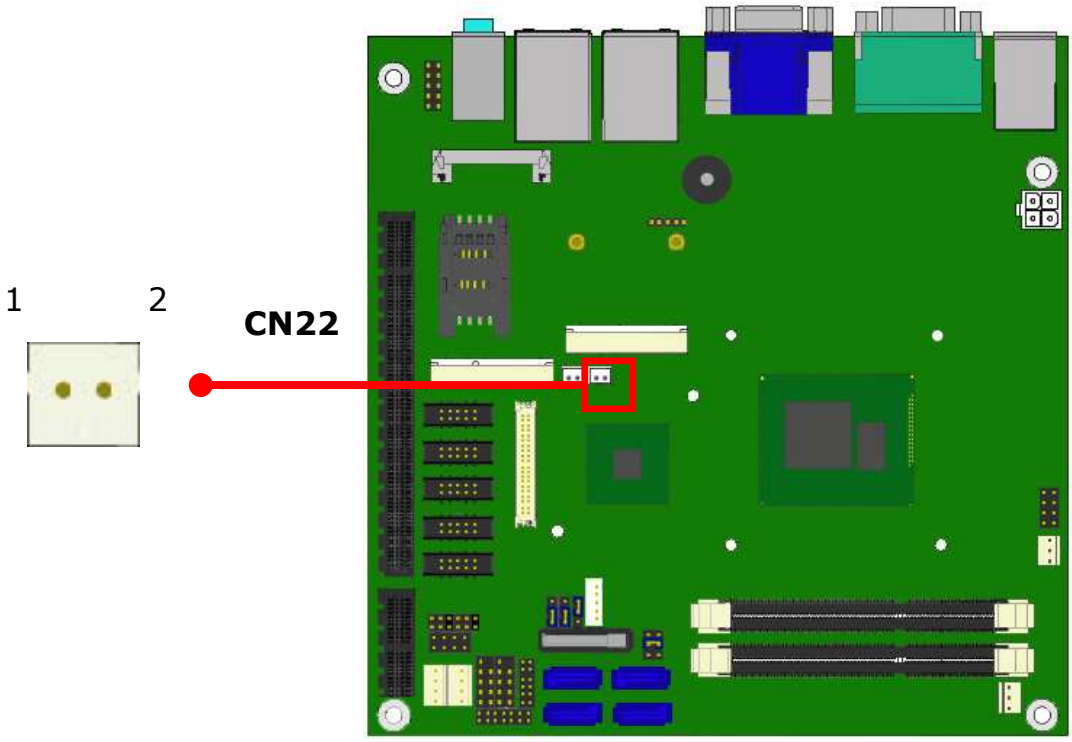


- 2.4.15 : CN22 for Half-size Mini-PCIe WLAN LED indictor

CN22 : 1 x 2 , 2-pin wafer			
Pin	**Signal**	**Pin**	**Signal**
1	LED_WLAN	2	+3.3V

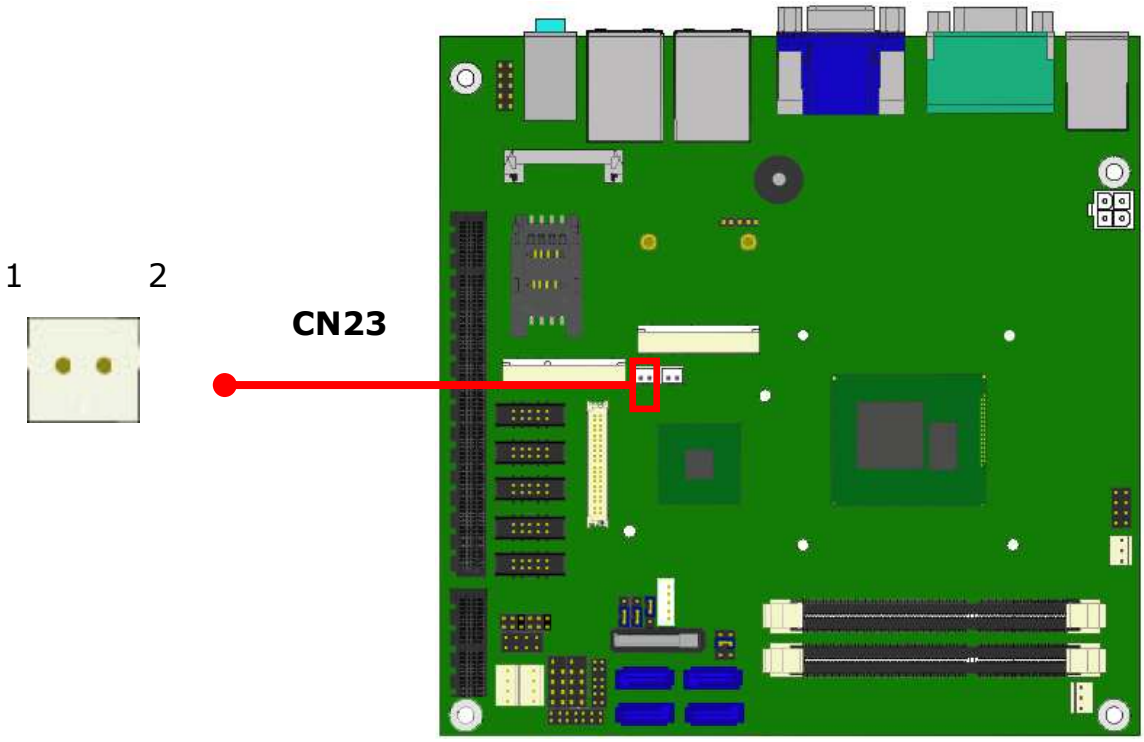
Note: Half-size Mini-PCIe card could support USB , SATA or PCIe signal.

You can select different mode in the BIOS . The default setting is PCIE signal.



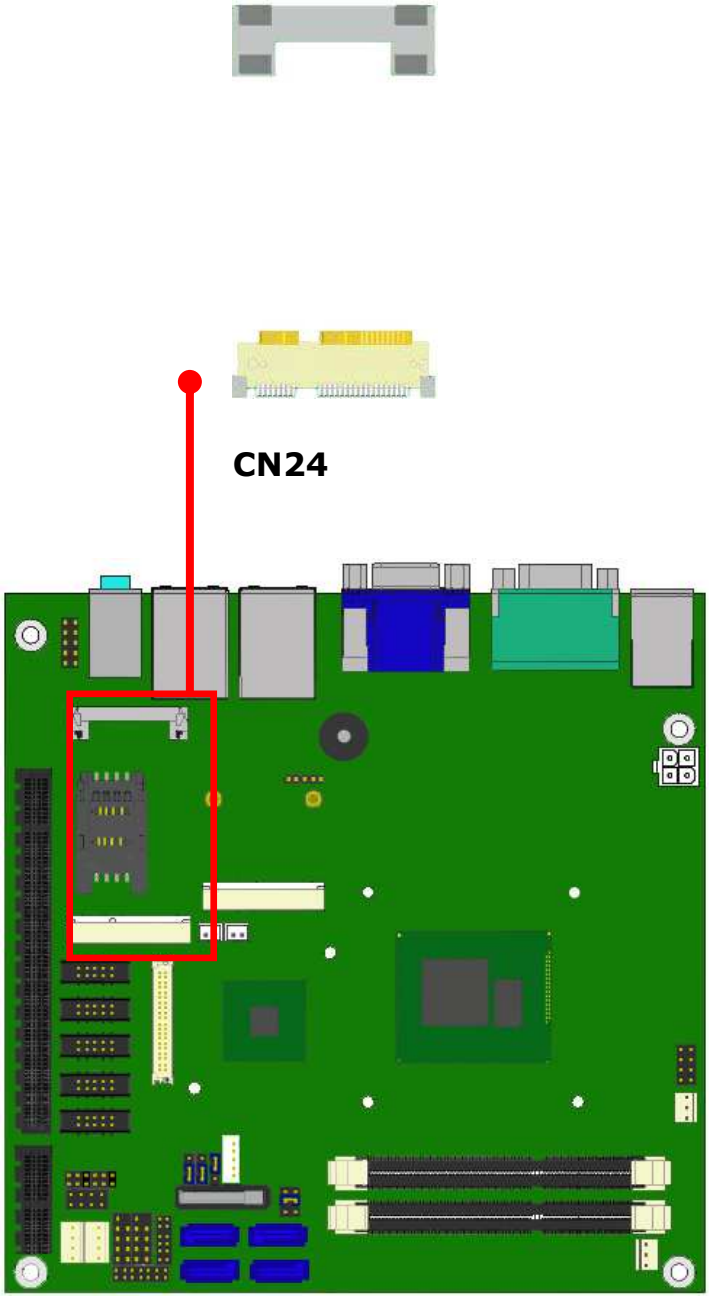
- 2.4.16 : CN23 for Full-size Mini-PCIe WLAN LED indictor

CN23 : 1 x 2 , 2-pin wafer			
Pin	**Signal**	**Pin**	**Signal**
1	LED_WLAN	2	+3.3V



- 2.4.17 : CN24 for Full-size Mini-PCIe socket

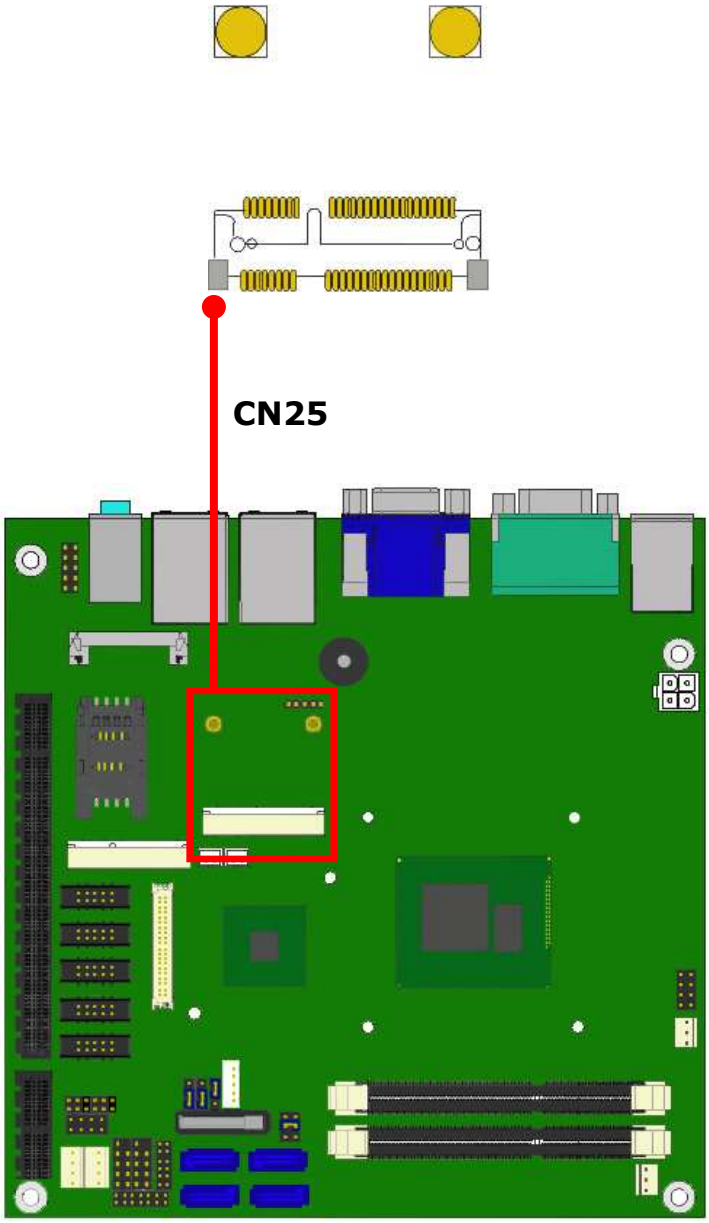
Pin	Signal	Pin	Signal
1	WAKE	27	GND
2	+3.3V AUX	28	+1.5V
3	N/C	29	GND
4	GND	30	SMBCLK
5	N/C	31	PETN0
6	+1.5V	32	SMBDATA
7	CLKREQ	33	PETP0
8	UIM_PWR	34	GND
9	GND	35	GND
10	UIM_DATA	36	USB_D-
11	REFCLK-	37	GND
12	UIM_CLK	38	USB_D+
13	REFCLK+	39	+3.3V AUX
14	UIM_RESET	40	GND
15	GND	41	+3.3V AUX
16	UIM_VPP	42	LED_WWAN
17	UIM_C8	43	GND
18	GND	44	LED_WLAN
19	UIM_C4	45	N/C
20	W_Disable	46	N/C
21	GND	47	N/C
22	PERST	48	+1.5V
23	PERN0	49	N/C
24	+3.3V AUX	50	GND
25	PERP0	51	N/C
26	GND	52	+3.3V AUX



- 2.4.18 : CN25 for Half-size Mini-PCIe socket.

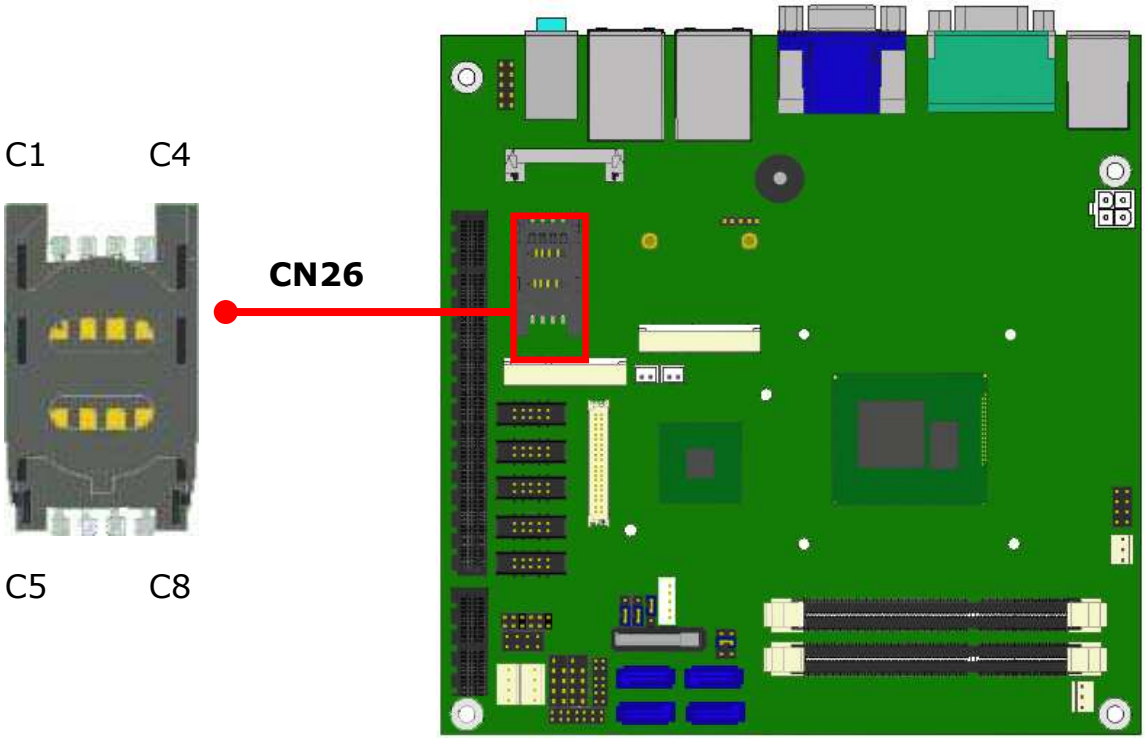
Note: Half-size Mini-PCIe card could support SATA or PCIe signal. The default setting is PCIE signal. You can select different mode in the BIOS

Pin	Signal	Pin	Signal
1	WAKE	27	GND
2	+3.3V AUX	28	+1.5V
3	Reserved	29	GND
4	GND	30	SMBCLK
5	Reserved	31	PETN0
6	+1.5V	32	SMBDATA
7	CLKREQ	33	PETP0
8	Reserved	34	GND
9	GND	35	GND
10	UIM_DATA	36	USB_D-
11	REFCLK-	37	Reserved
12	Reserved	38	USB_D+
13	REFCLK+	39	Reserved
14	Reserved	40	GND
15	GND	41	Reserved
16	Reserved	42	LED_WWAN
17	Reserved	43	Reserved
18	GND	44	LED_WLAN
19	Reserved	45	Reserved
20	Reserved	46	N/C
21	GND	47	Reserved
22	PERST	48	+1.5V
23	PERN0	49	Reserved
24	+3.3V AUX	50	GND
25	PERP0	51	Reserved
26	GND	52	+3.3V



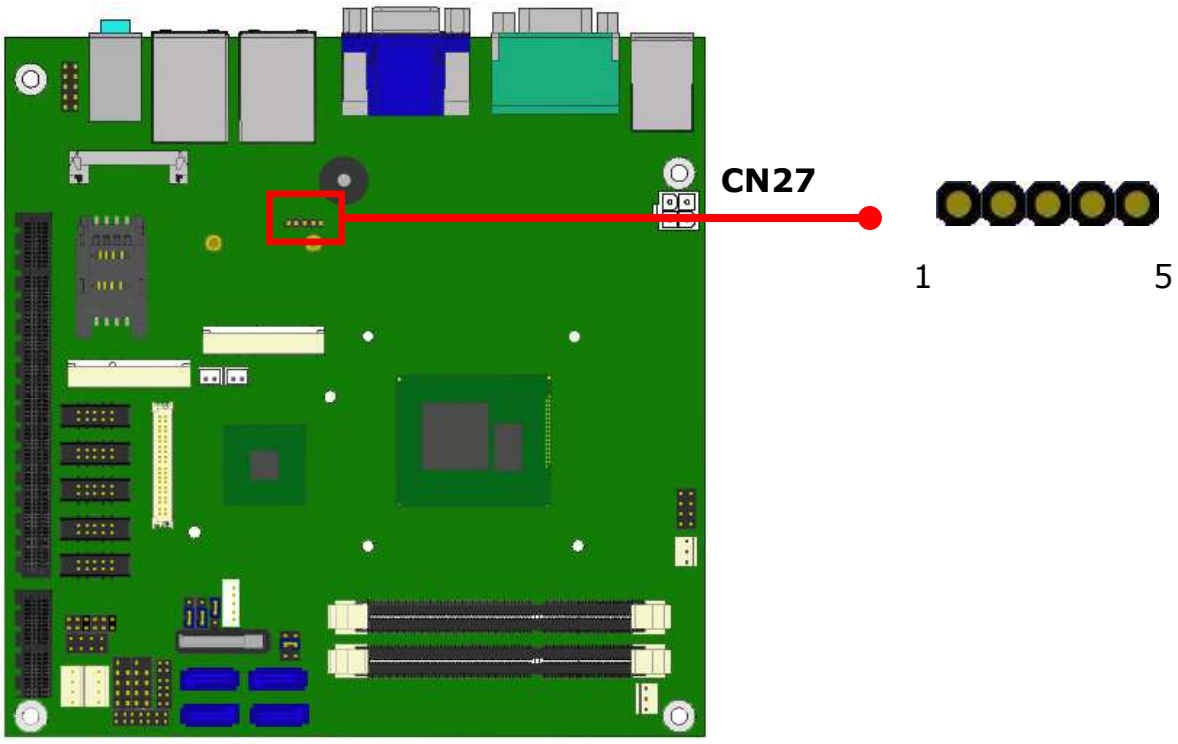
- 2.4.19 : CN26 for SIM holder

CN26 : SIM card holder			
Pin	**Signal**	**Pin**	**Signal**
C1	VCC	C2	RESET
C3	CLOCK	C4	Reserved
C5	GND	C6	VPP
C7	I/O	C8	Reserved



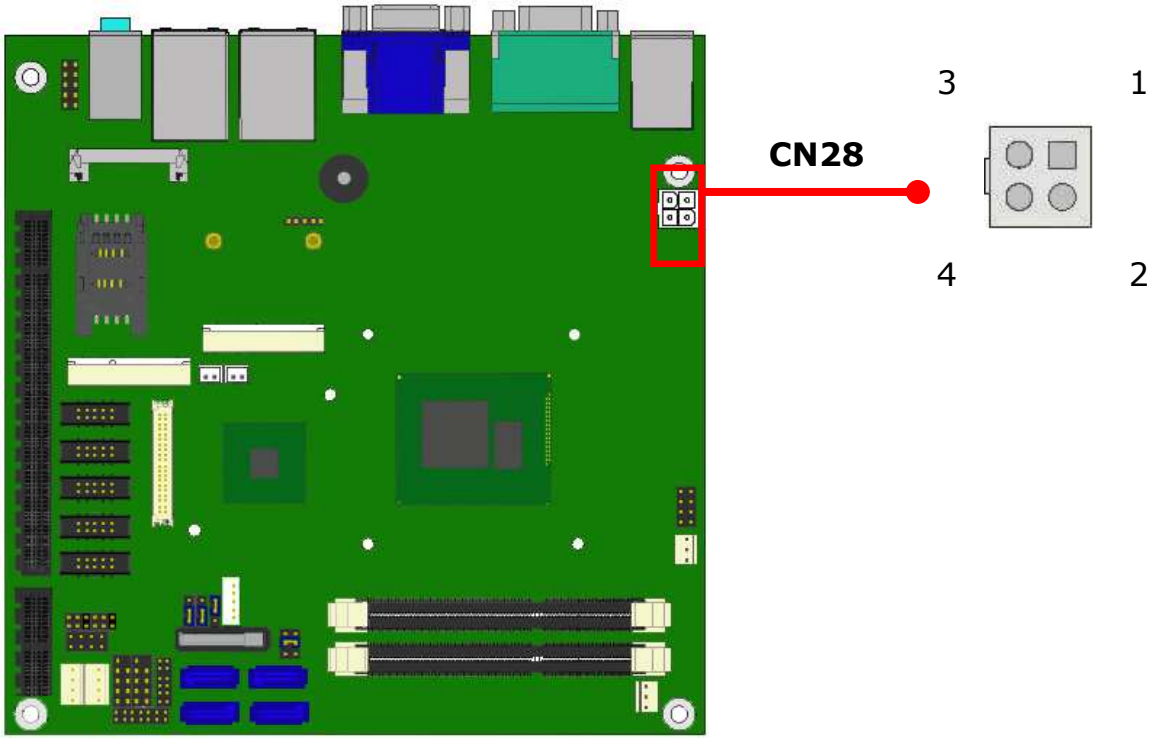
- 2.4.16 : CN27 for SMBUS pin header

CN27 : 1 x 5 pin header , 2.00 mm pitch			
Pin	**Signal**	**Pin**	**Signal**
1	+5V	2	Clock
3	Data	4	N/C
5	GND		



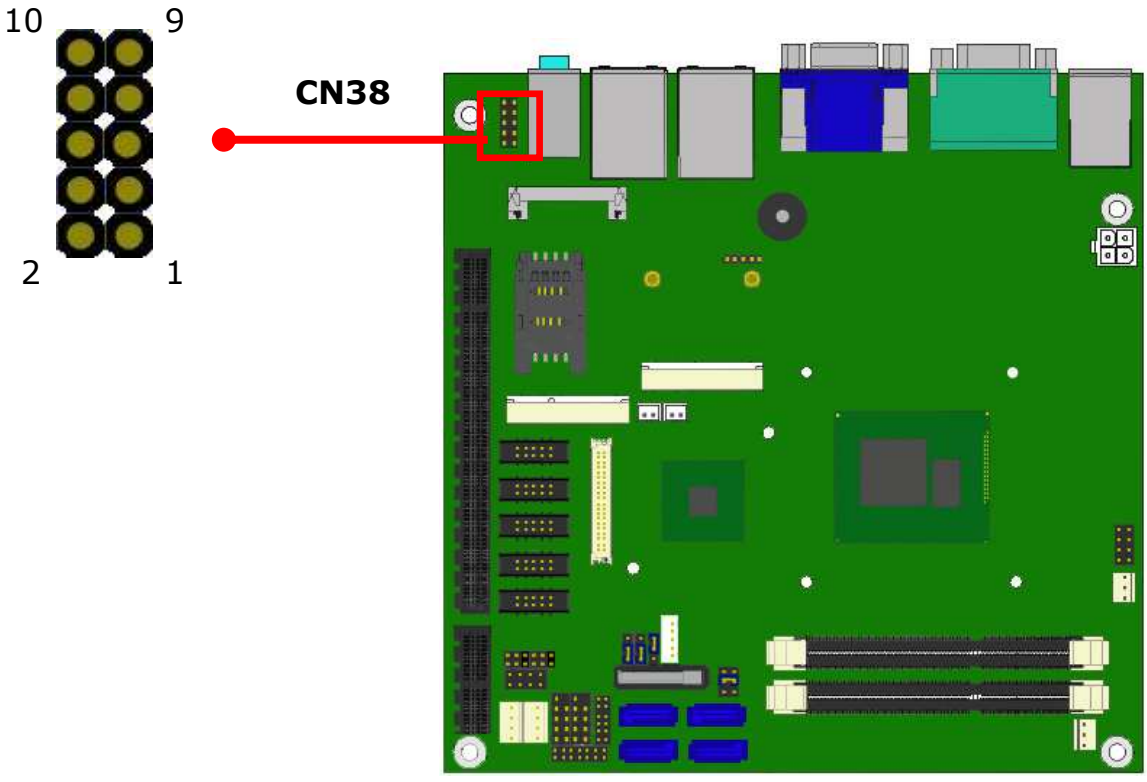
- 2.4.17 : CN28 for internal 4-pin power input

CN28 : ATX 2 x 2			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	GND
3	8V ~ 32V DC input	4	8V ~ 32V DC input



- 2.4.13 : CN38 for front panel Audio pin header

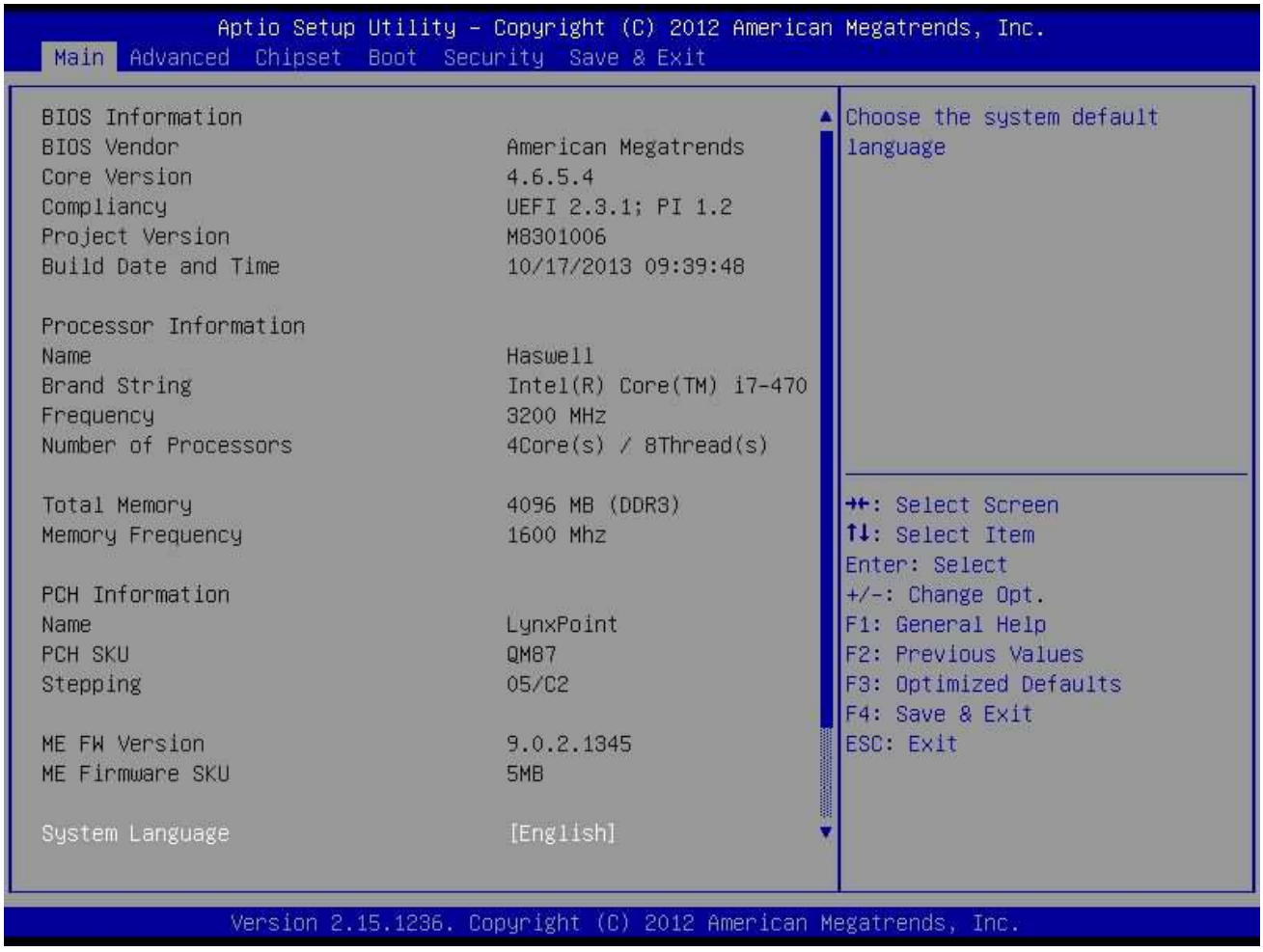
CN38 : 2 x 5 header, pitch 2.00 mm			
Pin	**Signal**	**Pin**	**Signal**
1	Mic-In_L	2	GND
3	Mic-In_R	4	N/C
5	Line-Out_R	6	Mic-In_JD
7	GND	8	N/C
9	Line-Out_L	10	Line-Out_JD



3. BIOS setting Menu

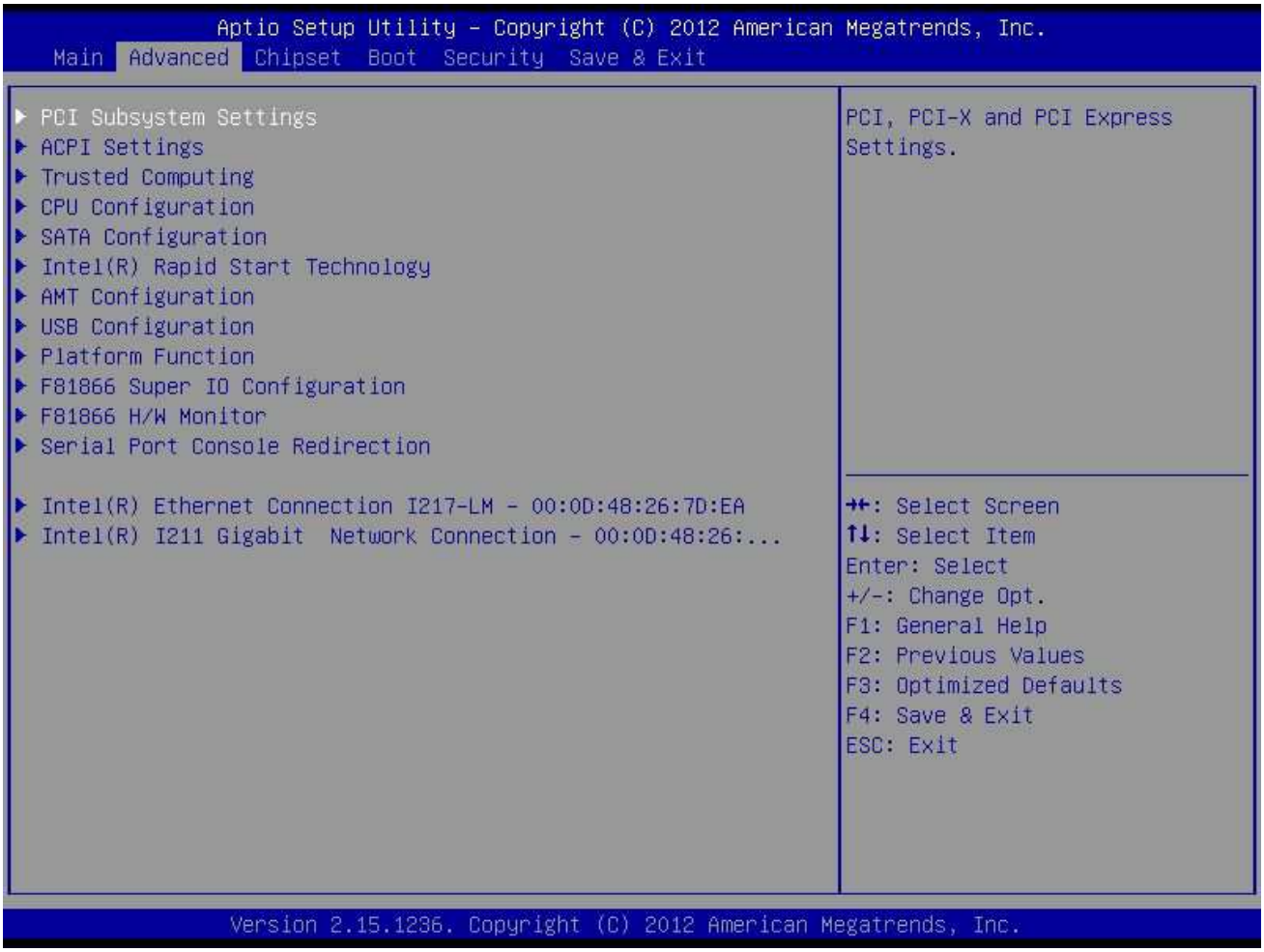
- 3.1 Main Menu

The Main Menu of BIOS Setup Utility provide a quick overview of basic system information and the ability to change the system Date, time ……..



- 3.2 Advanced Menu

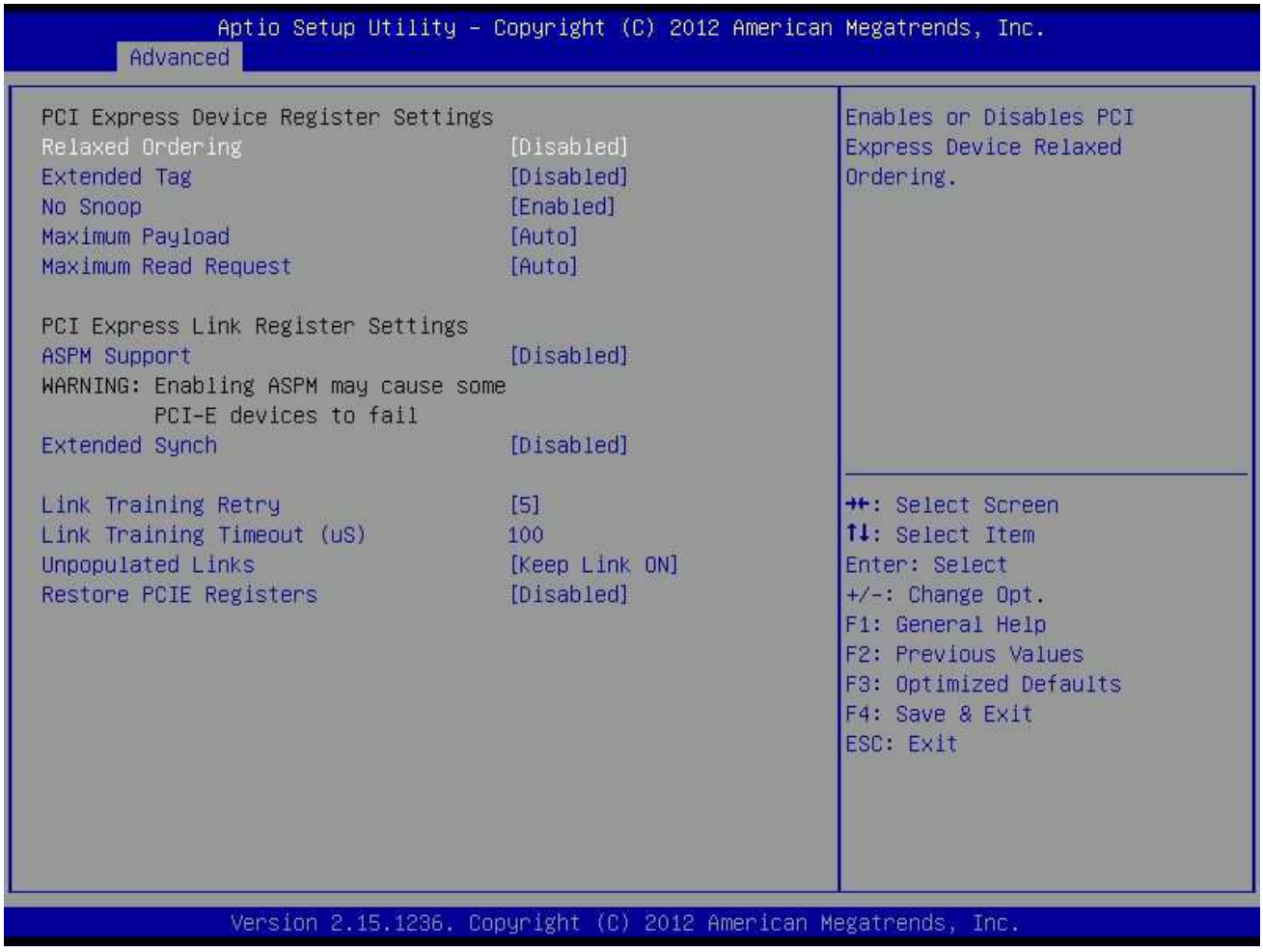
The Advanced Menu of BIOS Setup Utility allows users to configure advanced system settings.



- 3.2.1 Advanced Menu

PCI Express Setting:

Description: This item manually sets the maximum read request size of the PCI Express device or allows the system BIOS to choose the value (Auto). The options are Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes and 4096 Bytes.

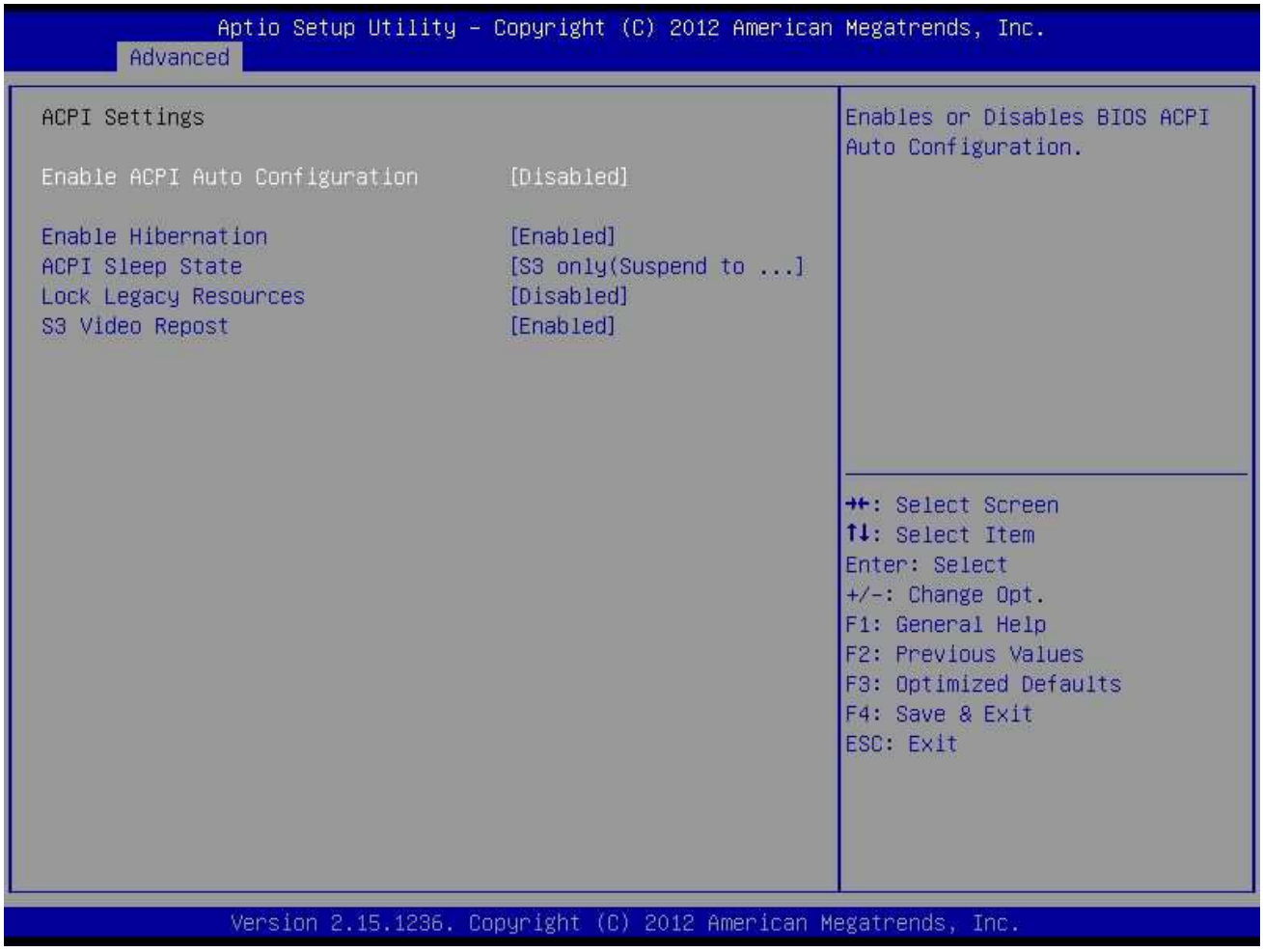

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
PCI Express Device Register Settings
Relaxed Ordering [Disabled]
Extended Tag [Disabled]
No Snoop [Enabled]
Maximum Payload [Auto]
Maximum Read Request [Auto]
PCI Express Link Register Settings
ASPM Support [Disabled]
WARNING: Enabling ASPM may cause some
PCI-E devices to fail
Extended Synch [Disabled]
Link Training Retry [5]
Link Training Timeout (uS) 100
Unpopulated Links [Keep Link ON]
Restore PCIE Registers [Disabled]
Enables or Disables PCI Express Device Relaxed Ordering.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

- 3.2.2 Advanced Menu

ACPI Setting:

Enable ACPI Auto Configuration < Disable >

Description : Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

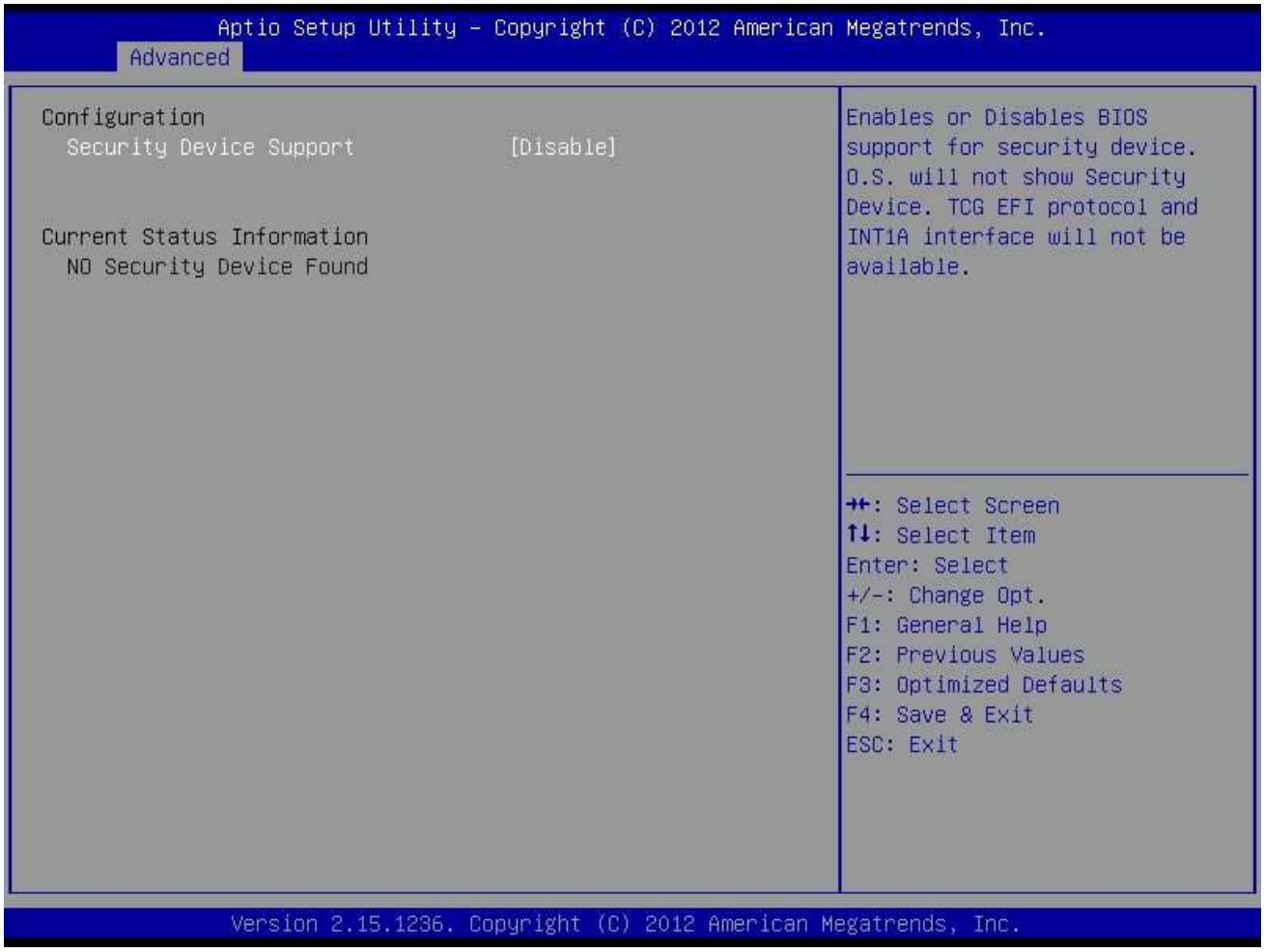

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
ACPI Settings
Enable ACPI Auto Configuration [Disabled]
Enable Hibernation [Enabled]
ACPI Sleep State [S3 only(Suspend to ...]
Lock Legacy Resources [Disabled]
S3 Video Repost [Enabled]
Enables or Disables BIOS ACPI Auto Configuration.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

- 3.2.3 Advanced Menu

Trusted Computing:

Security Device Support *< Disable >*

Description : Select Enabled to activate support for trusted platforms (TPM 1.1/1.2) and allow the BIOS to automatically download the drivers needed to provide support for the platforms specified. The options are Disable and Enable.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Configuration
Security Device Support [Disable]
Current Status Information
NO Security Device Found
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

- 3.2.4 Advanced Menu

CPU Configuration:

This item displays the current CPU Revision, Current CPU1 Memory Frequency, Memory Type and Memory Reference Code Revision.

Hyper-threading :

Intel® Hyper Threading Technology (Available when supported by the OS and the CPU). Select Enabled to enable Hyper_Threading support to increase CPU performance. The options are Enabled and Disabled.

Active Processor Cores :

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are All, l, 2 and 3.

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
CPU Configuration
Intel(R) Core(TM) i7-4700HQ CPU @ 2.40GHz
CPU Signature 306c3
Microcode Patch 8
Max CPU Speed 2400 MHz
Min CPU Speed 800 MHz
CPU Speed 3200 MHz
Processor Cores 4
Intel HT Technology Supported
Intel VT-x Technology Supported
Intel SMX Technology Not Supported
64-bit Supported
EIST Technology Supported
CPU C3 state Supported
CPU C6 state Supported
CPU C7 state Supported
L1 Data Cache 32 kB x 4
L1 Code Cache 32 kB x 4
L2 Cache 256 kB x 4
L3 Cache 6144 kB
Hyper-threading [Enabled]
Active Processor Cores [All]
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

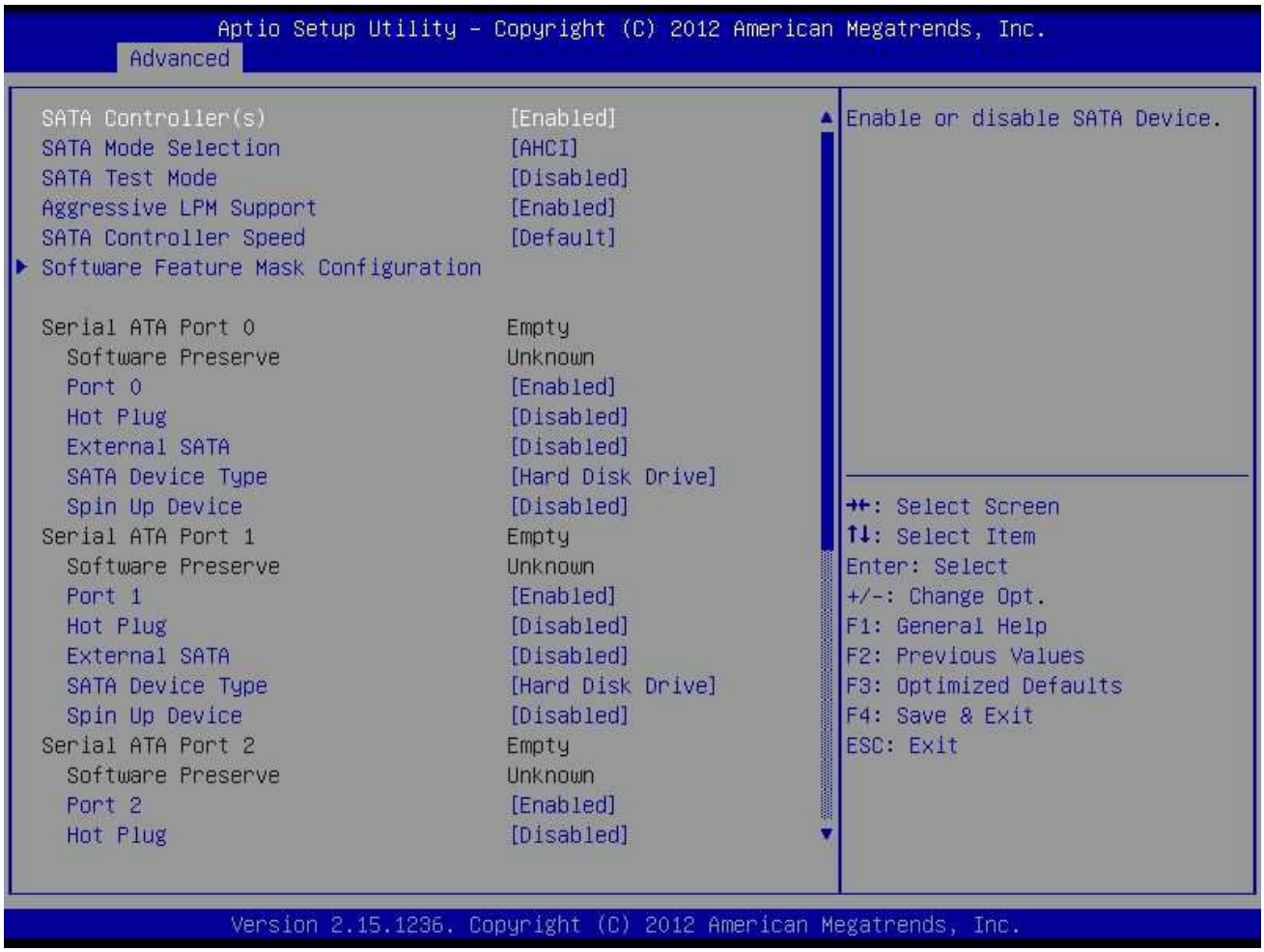
- 3.2.5 Advanced Menu

SATA Configuration:

When this submenu is selected, the AMI BIOS automatically detects the presence of the IDE Devices and displays the following items:

SATA Mode Selection :

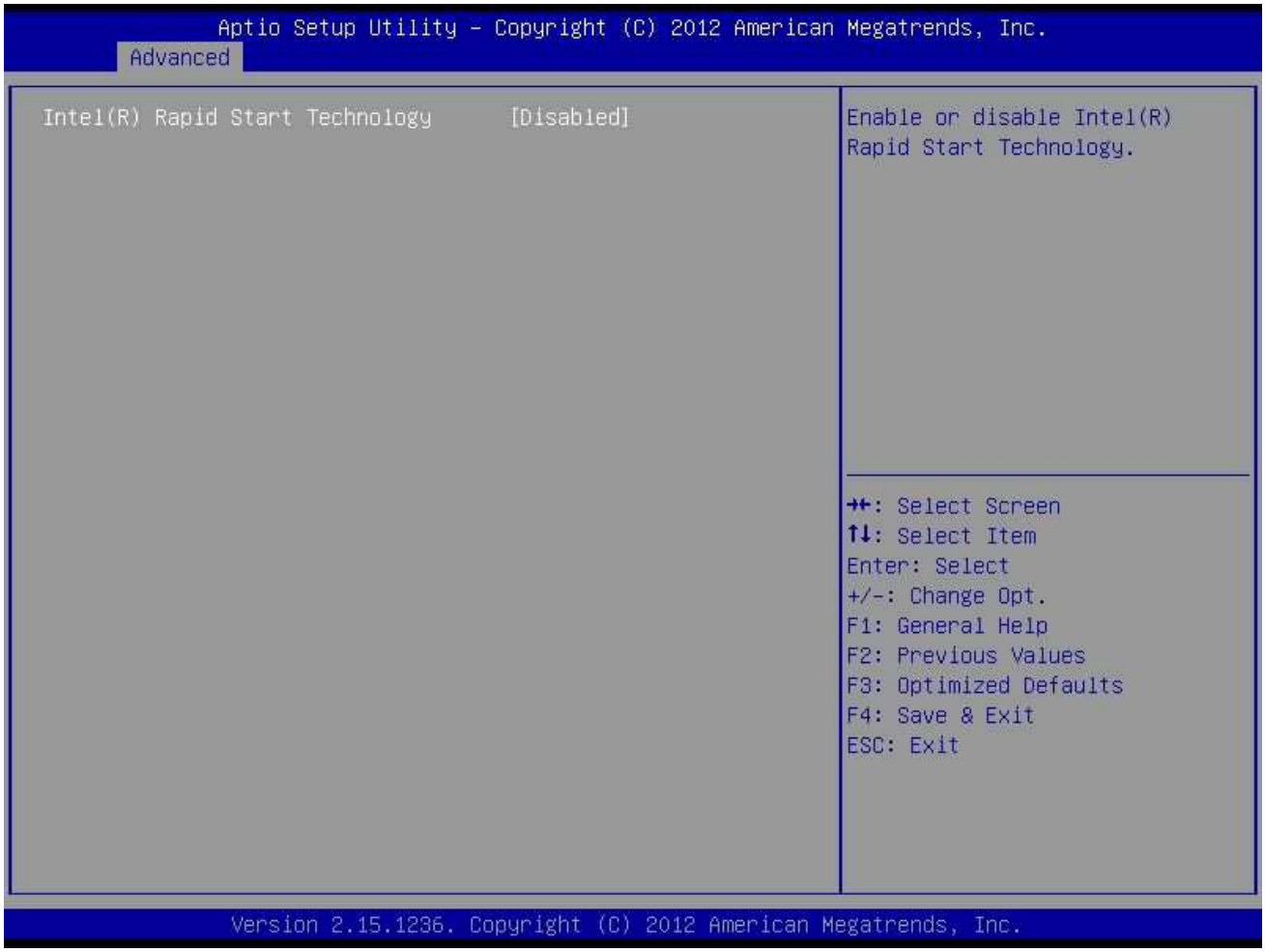
This item selects the mode for the installed drives. The options are Disabled, IDE Mode, AHCI Mode and RAID Mode.



- 3.2.6 Advanced Menu

Intel® Rapid Start Technology:	< Disabled >

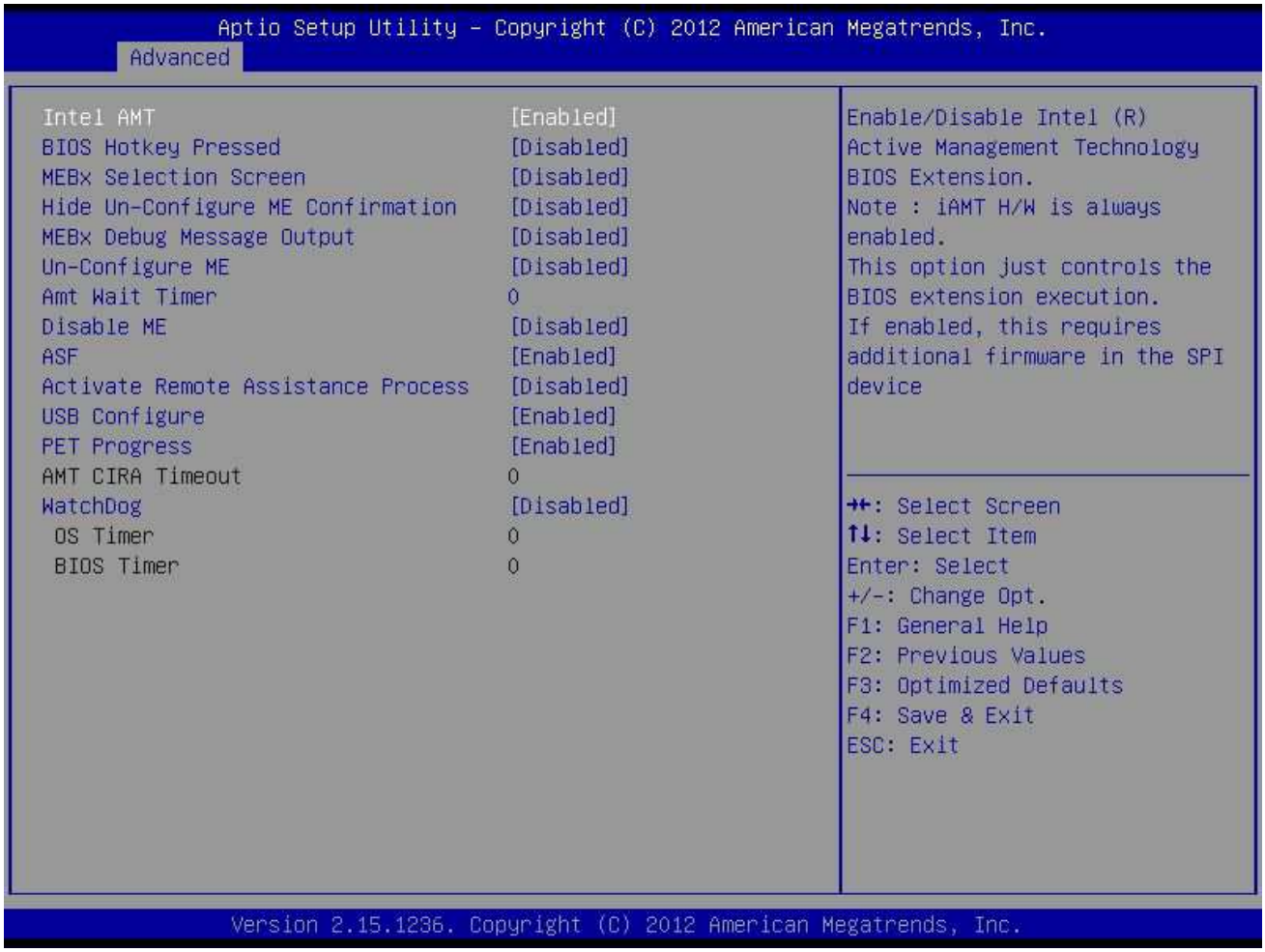
Description : Intel® Rapid Start Technology enables your system to get up and running faster from even the deepest sleep, saving time and power consumption.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Intel(R) Rapid Start Technology [Disabled]
Enable or disable Intel(R) Rapid Start Technology.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

- 3.2.6 Advanced Menu

Intel® AMT: < Enabled >

Description : This option enables Intel AMT support. The options are Enabled and Disabled..


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Intel AMT [Enabled]
BIOS Hotkey Pressed [Disabled]
MEBx Selection Screen [Disabled]
Hide Un-Configure ME Confirmation [Disabled]
MEBx Debug Message Output [Disabled]
Un-Configure ME [Disabled]
Amt Wait Timer 0
Disable ME [Disabled]
ASF [Enabled]
Activate Remote Assistance Process [Disabled]
USB Configure [Enabled]
PET Progress [Enabled]
AMT CIRA Timeout 0
WatchDog [Disabled]
OS Timer 0
BIOS Timer 0
Enable/Disable Intel (R) Active Management Technology BIOS Extension.
Note : iAMT H/W is always enabled.
This option just controls the BIOS extension execution.
If enabled, this requires additional firmware in the SPI device
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

- 3.2.6 Advanced Menu

USB Configuration:

This feature enables support for USB function parameters The options are Enabled, and Disabled.

Legacy USB Support:

This feature enables support for legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disable to have USB devices available only for EFl applications. The options are Enabled, Disabled and Auto.

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
USB Configuration
USB Module Version 8.10.27
USB Devices:
1 Drive, 2 Hubs
Legacy USB Support [Enabled]
USB3.0 Support [Enabled]
XHCI Hand-off [Enabled]
EHCI Hand-off [Disabled]
USB Mass Storage Driver Support [Enabled]
USB hardware delays and time-outs:
USB transfer time-out [20 sec]
Device reset time-out [20 sec]
Device power-up delay [Auto]
Mass Storage Devices:
JetFlashTranscend 2GB 8.07 [Auto]
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

- 3.2.6 Advanced Menu

SATA PCIE select:

Select Half-size Mini-PCIe socket to support SATA signal or PCIe signal.

Default is support STAT signal

COM2 port mode:

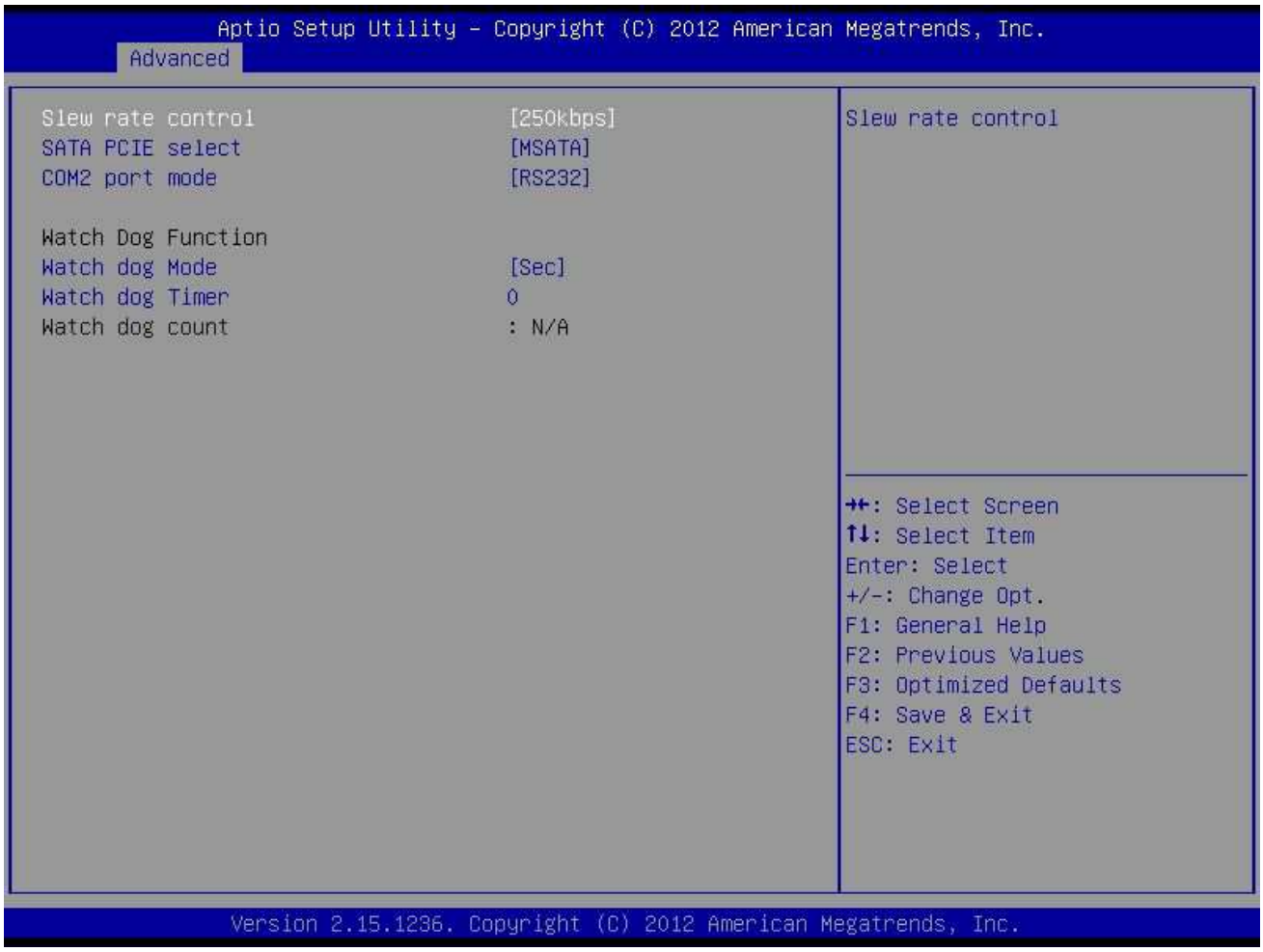
Select COM2 port to support RS232 , RS-422 or RS485 mode.

Default is RS232 mode

Watch Dog Function:

Allows AMT to reset or power down the system if the operating system or BIOS hangs or crashes.

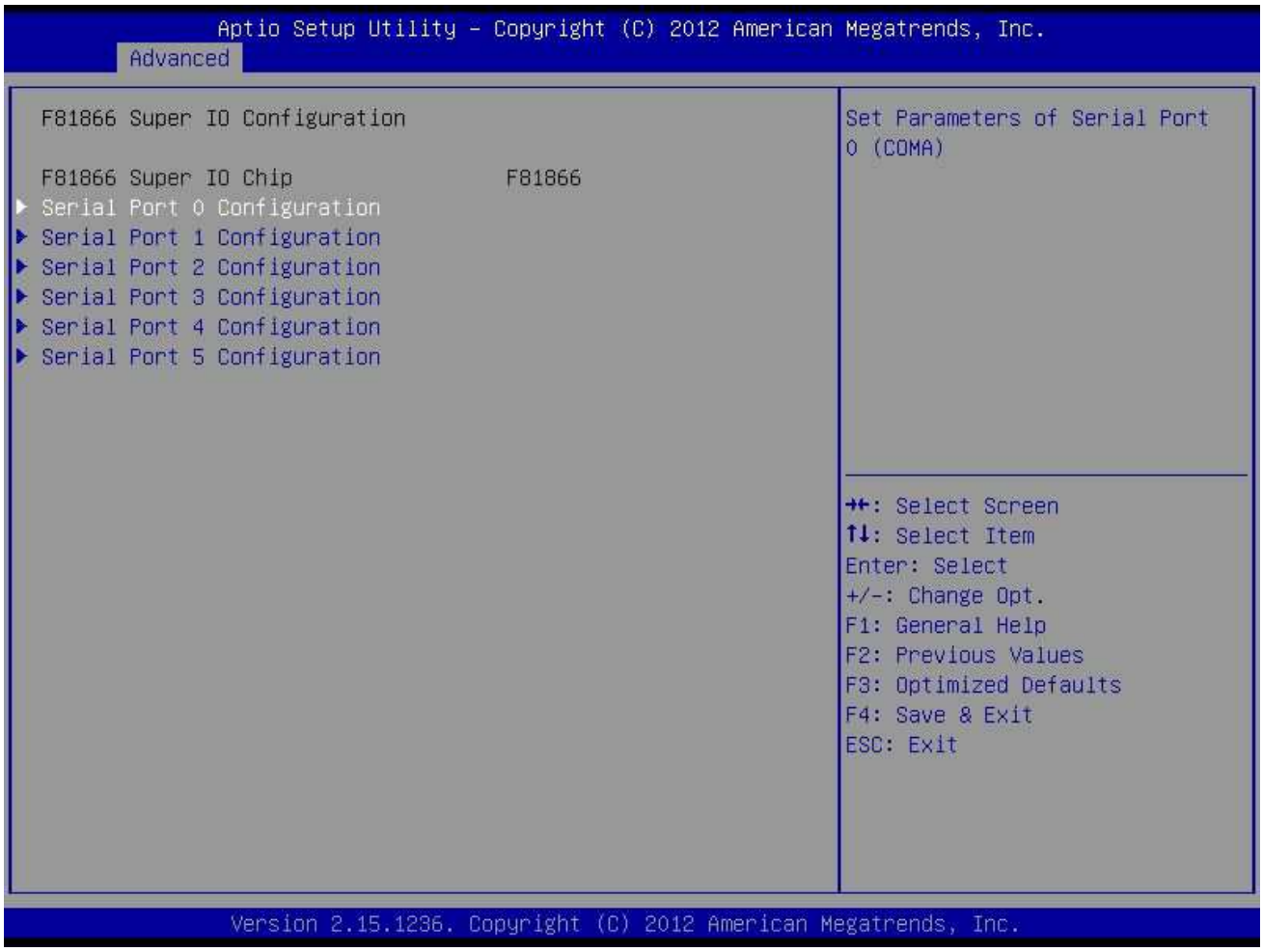
The options are Disabled, and Enabled.



- 3.2.6 Advanced Menu

F81866 Super IO Configuration:

Description : Select Enabled to enable the onboard serial port. The options are Enabled and Disabled.

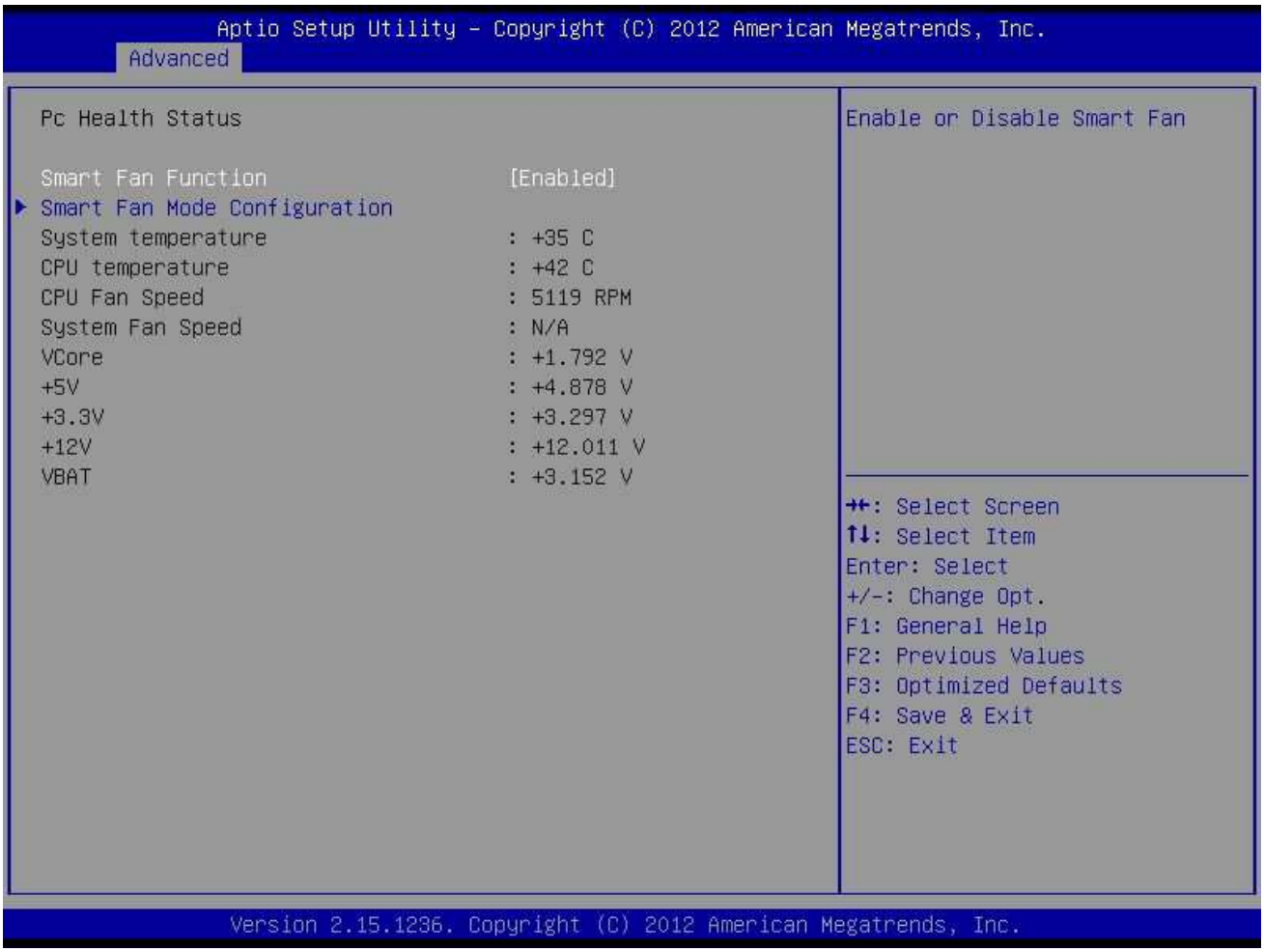

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
F81866 Super IO Configuration
F81866 Super IO Chip F81866
Serial Port 0 Configuration
Serial Port 1 Configuration
Serial Port 2 Configuration
Serial Port 3 Configuration
Serial Port 4 Configuration
Serial Port 5 Configuration
Set Parameters of Serial Port 0 (COMA)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

- 3.2.7 Advanced Menu

F81866 H/W monitor:

Smart Fan Mode Configuration *< Enabled/Disabled >*

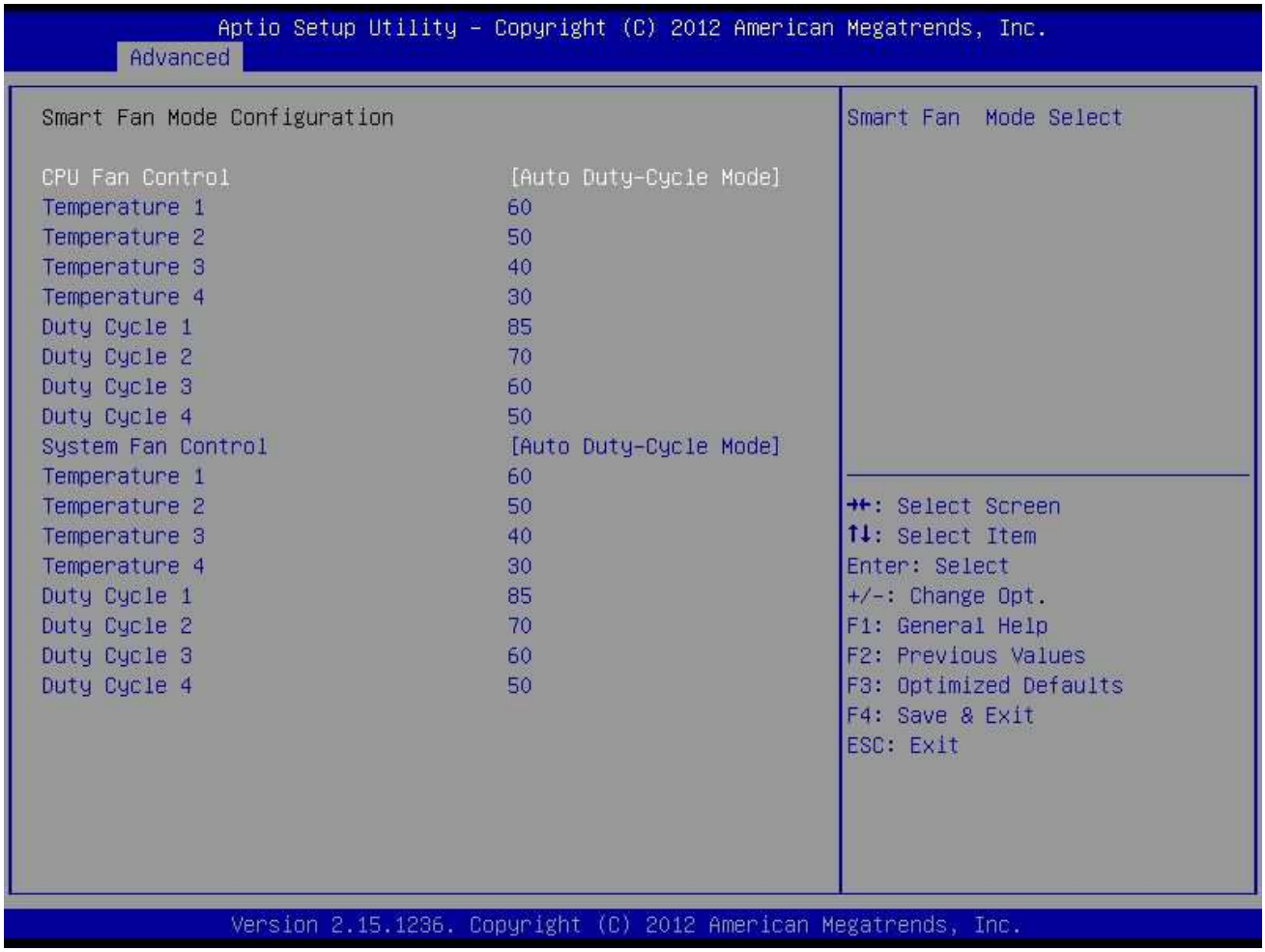
Description : This feature allows the user to check CPU temperature and the fan speed. And also displays the current voltages of the above voltage monitors


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Pc Health Status
Smart Fan Function [Enabled]
Smart Fan Mode Configuration
System temperature : +35 C
CPU temperature : +42 C
CPU Fan Speed : 5119 RPM
System Fan Speed : N/A
VCore : +1.792 V
+5V : +4.878 V
+3.3V : +3.297 V
+12V : +12.011 V
VBAT : +3.152 V
Enable or Disable Smart Fan
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

- 3.2.8 Advanced Menu

Smart Fan Mode Configuration

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase for effective system cooling. Select "Full Speed" to allow the onboard fans to run at full speed (of 100% Pulse Width Modulation Duty Cycle) for maximum cooling.



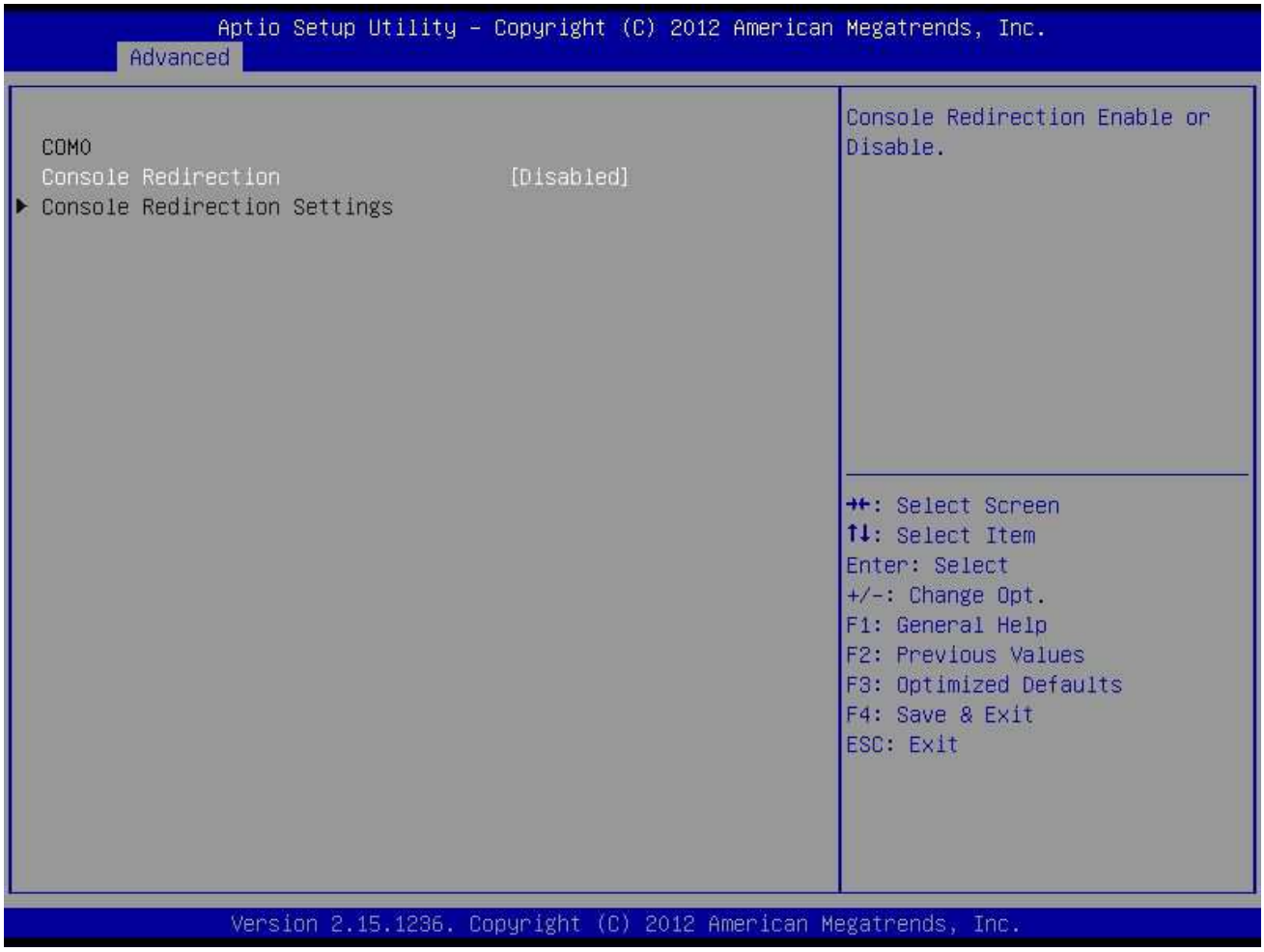
- 3.2.10 Advanced Menu

Serial Port Console Redirection

Console Redirection < Disabled >

Description : This feature allows the user to remotely access the entire boot sequence via a serial console

Default setting is Disabled



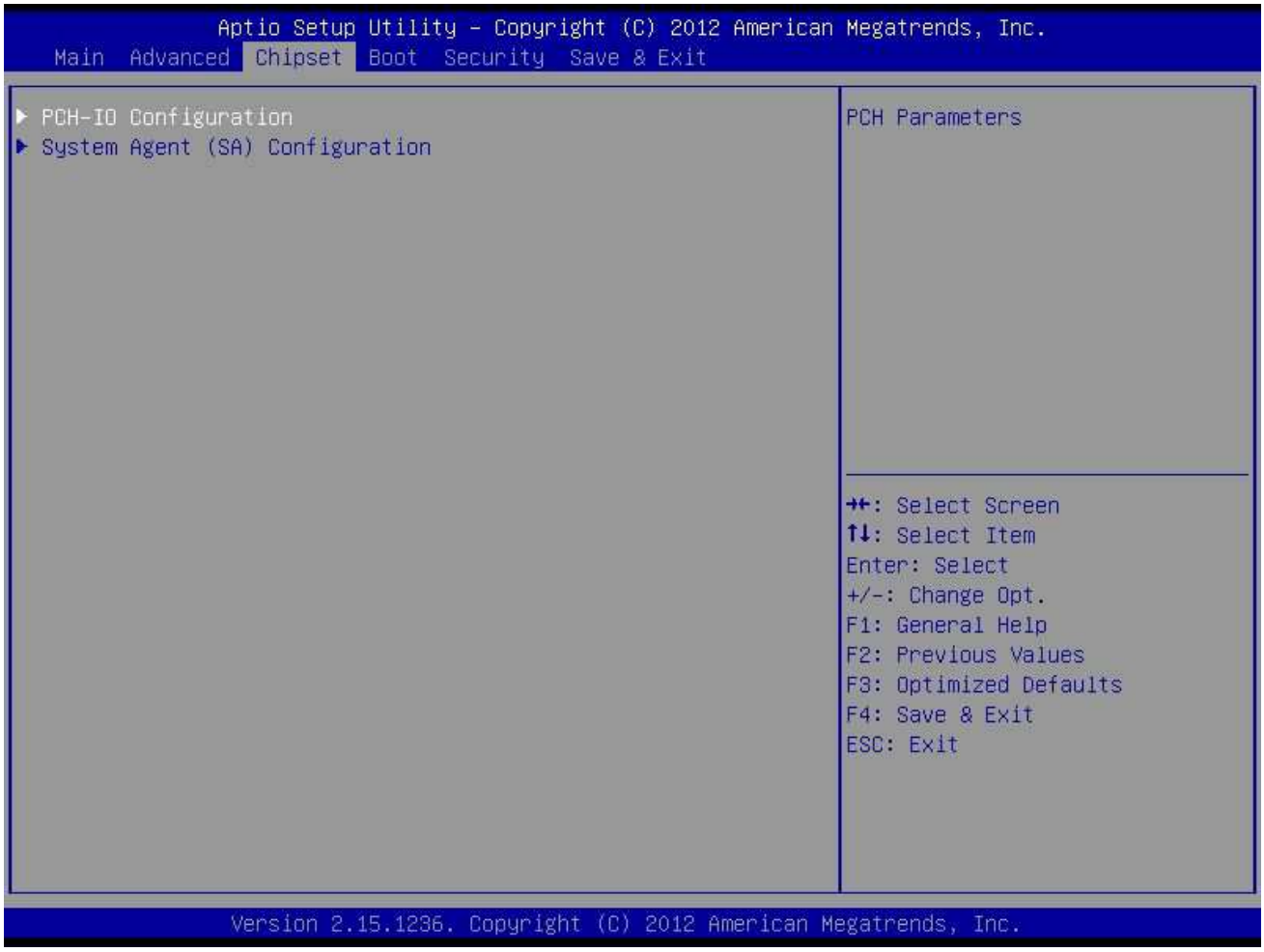
- 3.3 Chipset Menu

Serial Port Console Redirection

Console Redirection < Disabled >

Description : This feature allows the user to remotely access the entire boot sequence via a serial console

Default setting is Disabled


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
PCH-IO Configuration
System Agent (SA) Configuration
PCH Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

- 3.3.1 Chipset Menu

PCH LAN Controller :

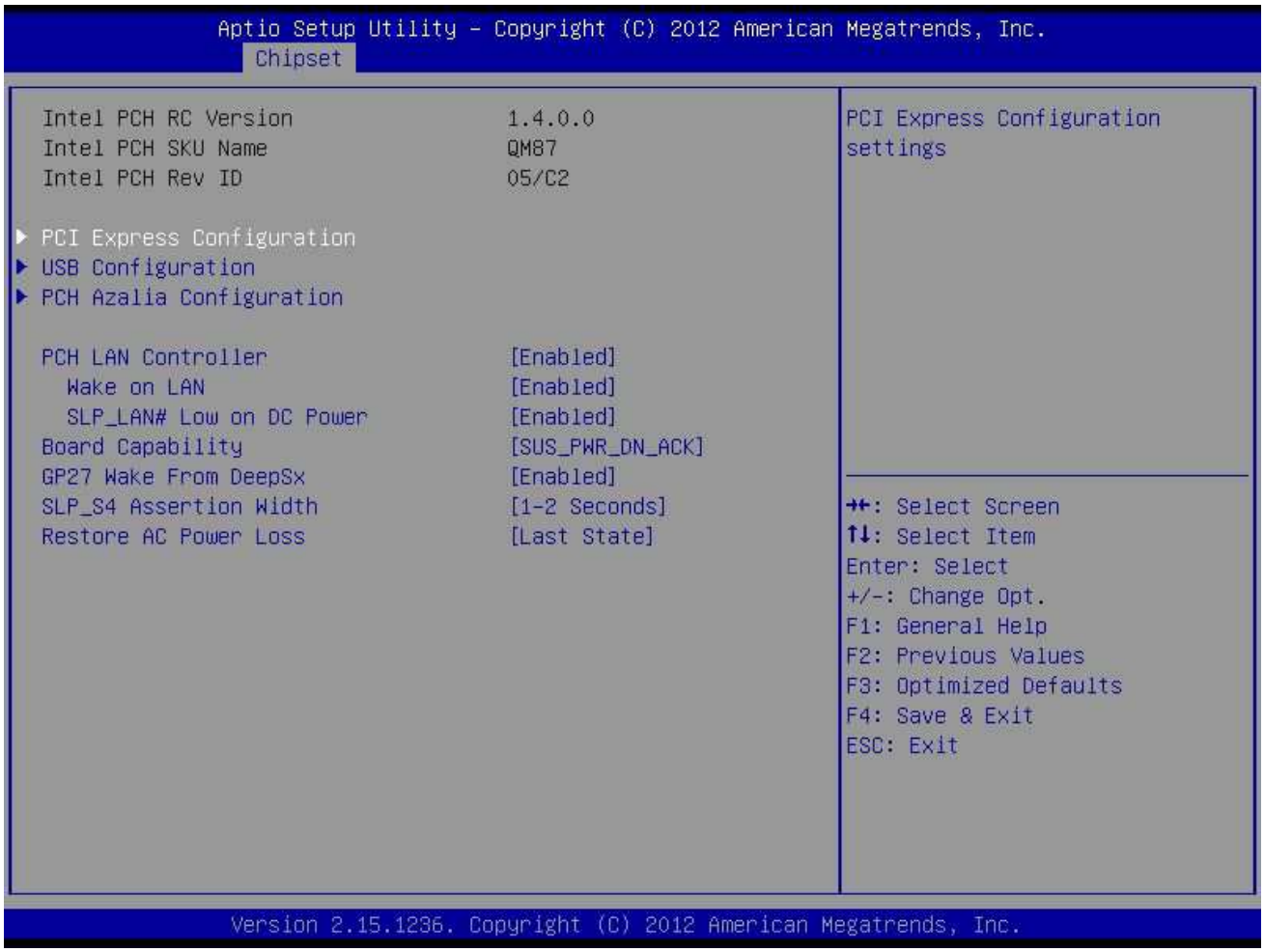
Select Enabled to enable the onboard gigabit Ethernet controller. The settings are Enabled and Disabled

Wake on LAN :

Select Enabled to enable the capability to 'wake-up' the system from the S5~power state (Soft Off State) through the Ethernet controller. The settings are Enabled and Disabled.

Restore AC Power Loss :

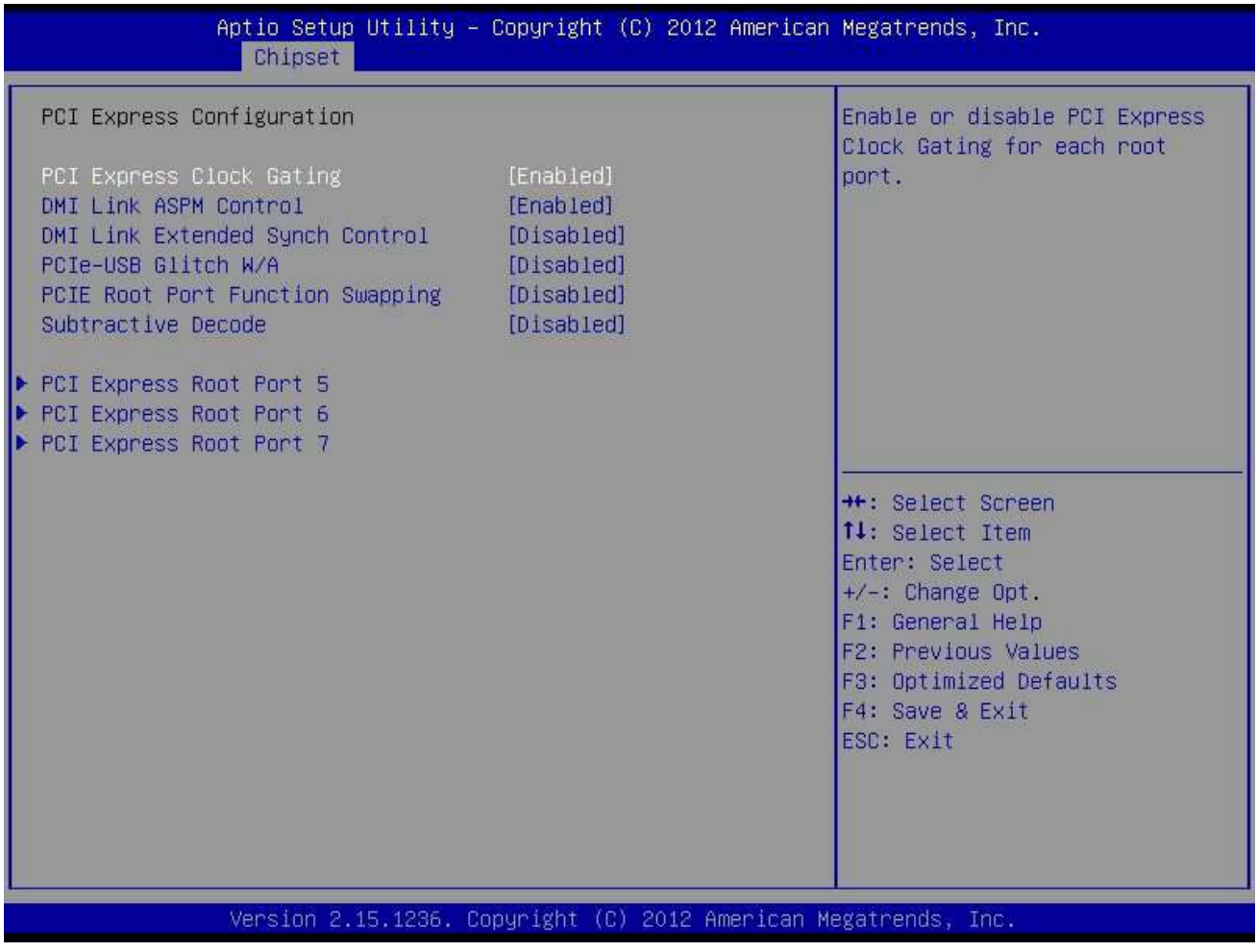
Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its' last power state before a power lost. The options are Power-On, Power-Off and Last State.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
Intel PCH RC Version 1.4.0.0
Intel PCH SKU Name QM87
Intel PCH Rev ID 05/C2
PCI Express Configuration
USB Configuration
PCH Azalia Configuration
PCH LAN Controller [Enabled]
Wake on LAN [Enabled]
SLP_LAN# Low on DC Power [Enabled]
Board Capability [SUS_PWR_DN_ACK]
GP27 Wake From DeepSx [Enabled]
SLP_S4 Assertion Width [1-2 Seconds]
Restore AC Power Loss [Last State]
PCI Express Configuration settings
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

- 3.3.2 Chipset Menu

PCI Express Configuration:

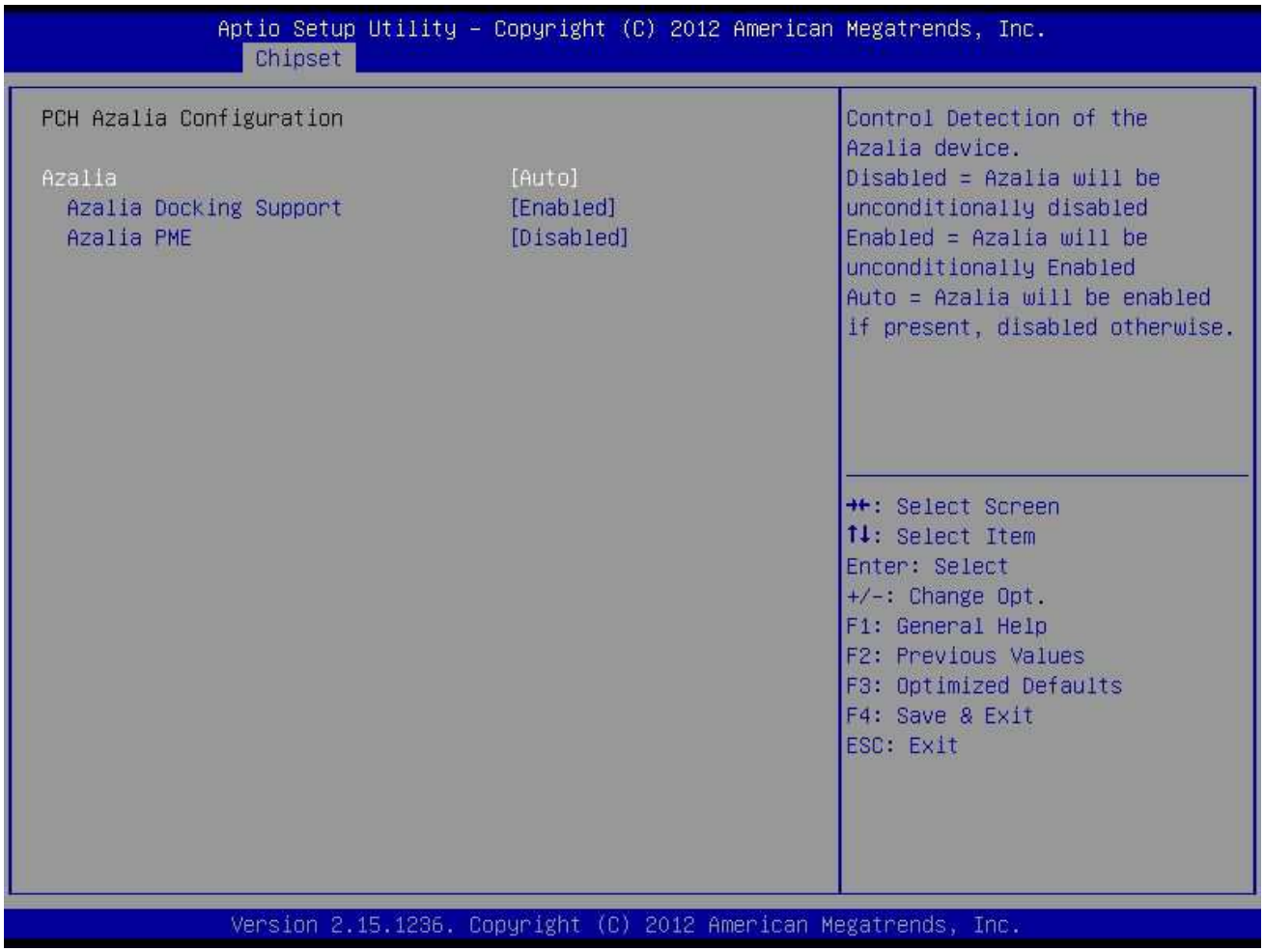
Description: Use this feature to enable or disable PCIe slot Option ROMs. The options are Disabled and Enabled.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
PCI Express Configuration
PCI Express Clock Gating [Enabled]
DMI Link ASPM Control [Enabled]
DMI Link Extended Synch Control [Disabled]
PCIe-USB Glitch W/A [Disabled]
PCIE Root Port Function Swapping [Disabled]
Subtractive Decode [Disabled]
PCI Express Root Port 5
PCI Express Root Port 6
PCI Express Root Port 7
Enable or disable PCI Express Clock Gating for each root port.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

- 3.3.3 Chipset Menu

PCH Azalia Configuration:

Description: Select Enabled to enable the Azalia High Definition Audio feature. The settings are Enabled and Disabled.

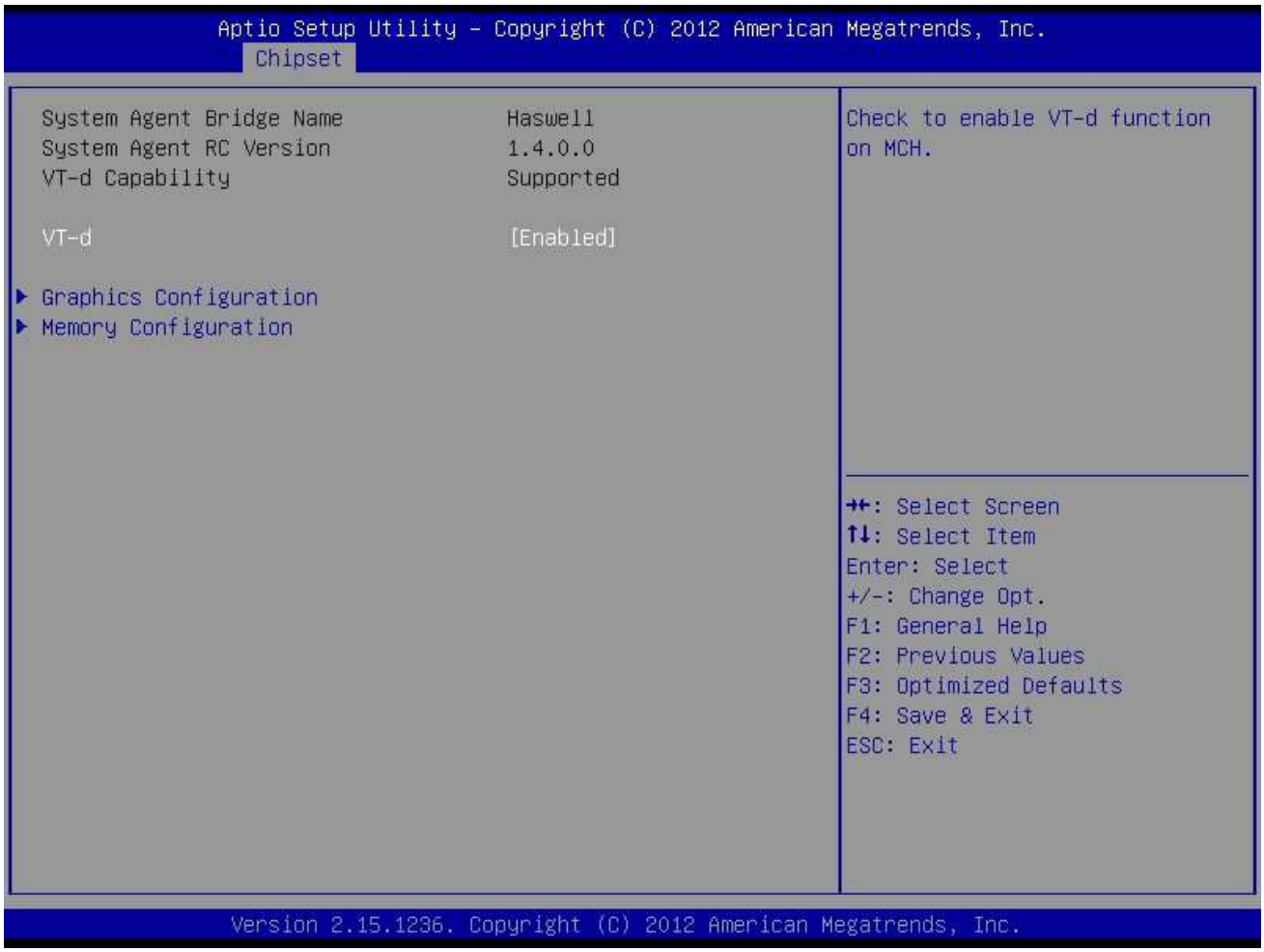

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
PCH Azalia Configuration
Azalia [Auto]
Azalia Docking Support [Enabled]
Azalia PME [Disabled]
Control Detection of the Azalia device.
Disabled = Azalia will be unconditionally disabled
Enabled = Azalia will be unconditionally Enabled
Auto = Azalia will be enabled if present, disabled otherwise.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

- 3.3.4 Chipset Menu

VT-d Capability: (Available when supported by the CPU)

VT-d < Disabled/enabled >

Description: Select Enabled to enable Intel's \/irtualization Technology support for Direct l/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource sharing across the lntel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are Enabled and Disabled.

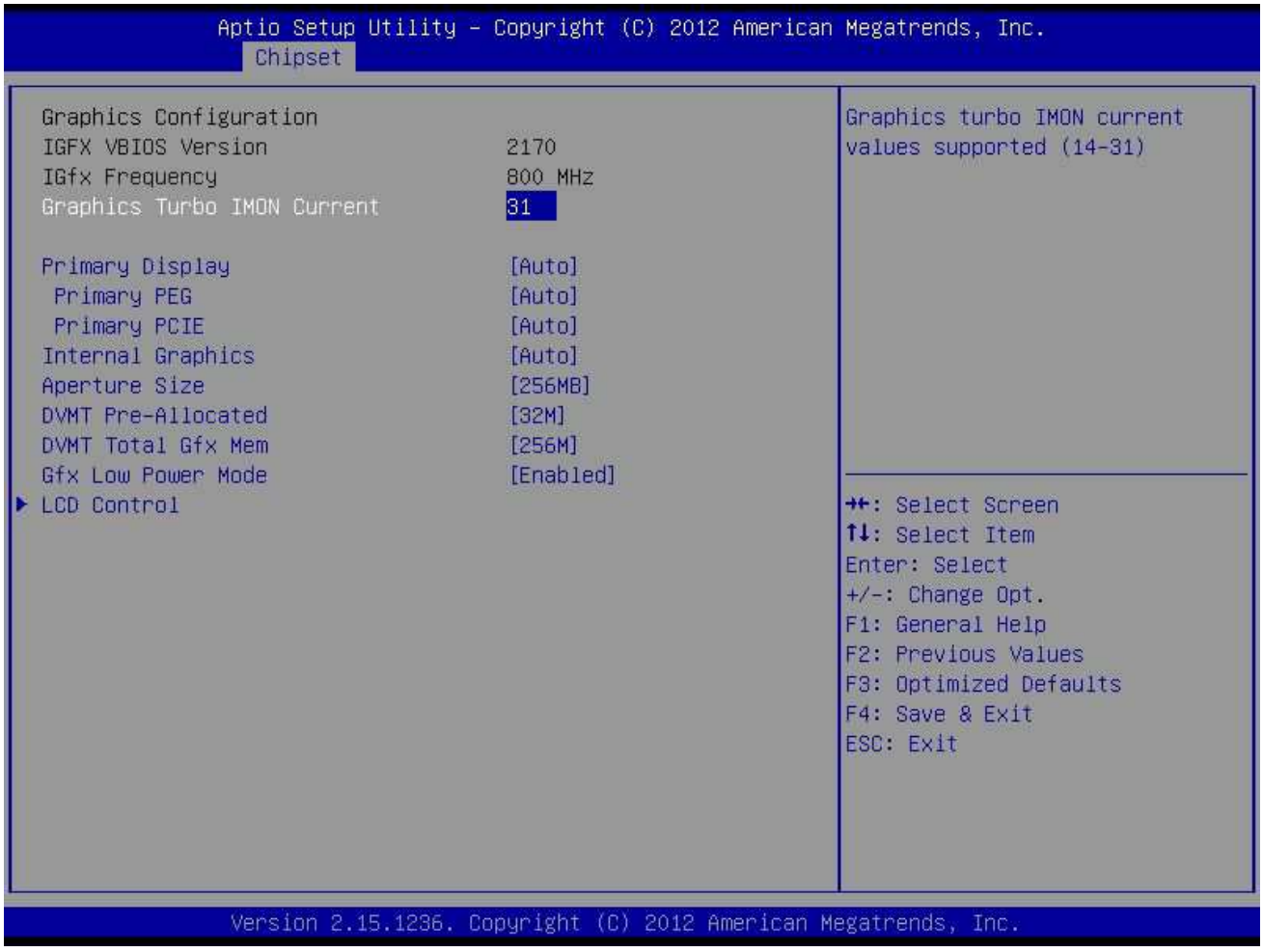


- 3.3.6 Chipset Menu

Graphics Configuration:

Description: Select primary video device that BIOS will use to for output
Default setting is <Auto>

IGT : Integrated Graphics Device.
PEG : PCI Express Graphics

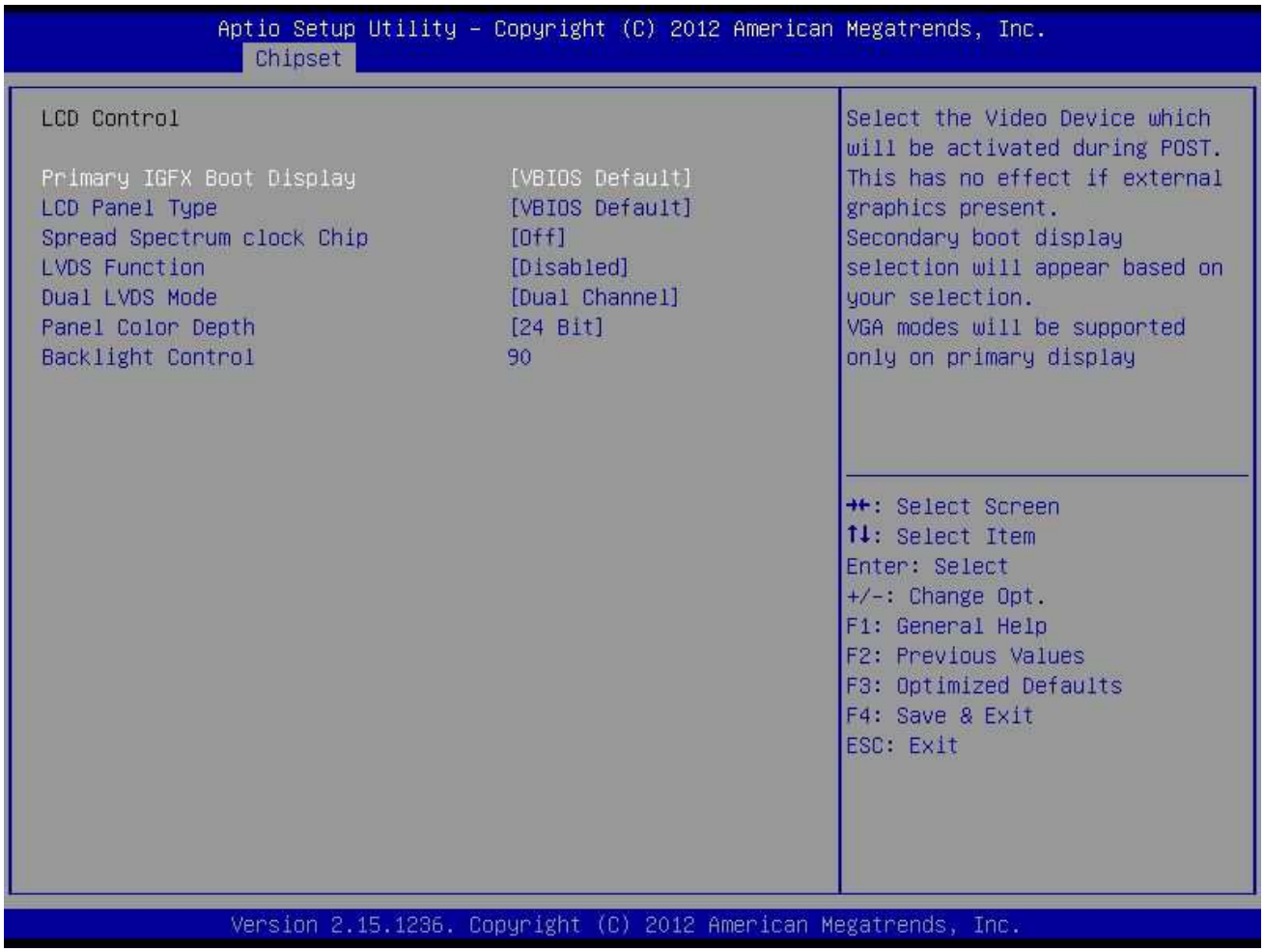


- 3.3.7 Chipset Menu

PCH-IO Configuration:

LCD Control

Description: This feature allows the user to select different LVDS Panel mode , resolution and backlight control

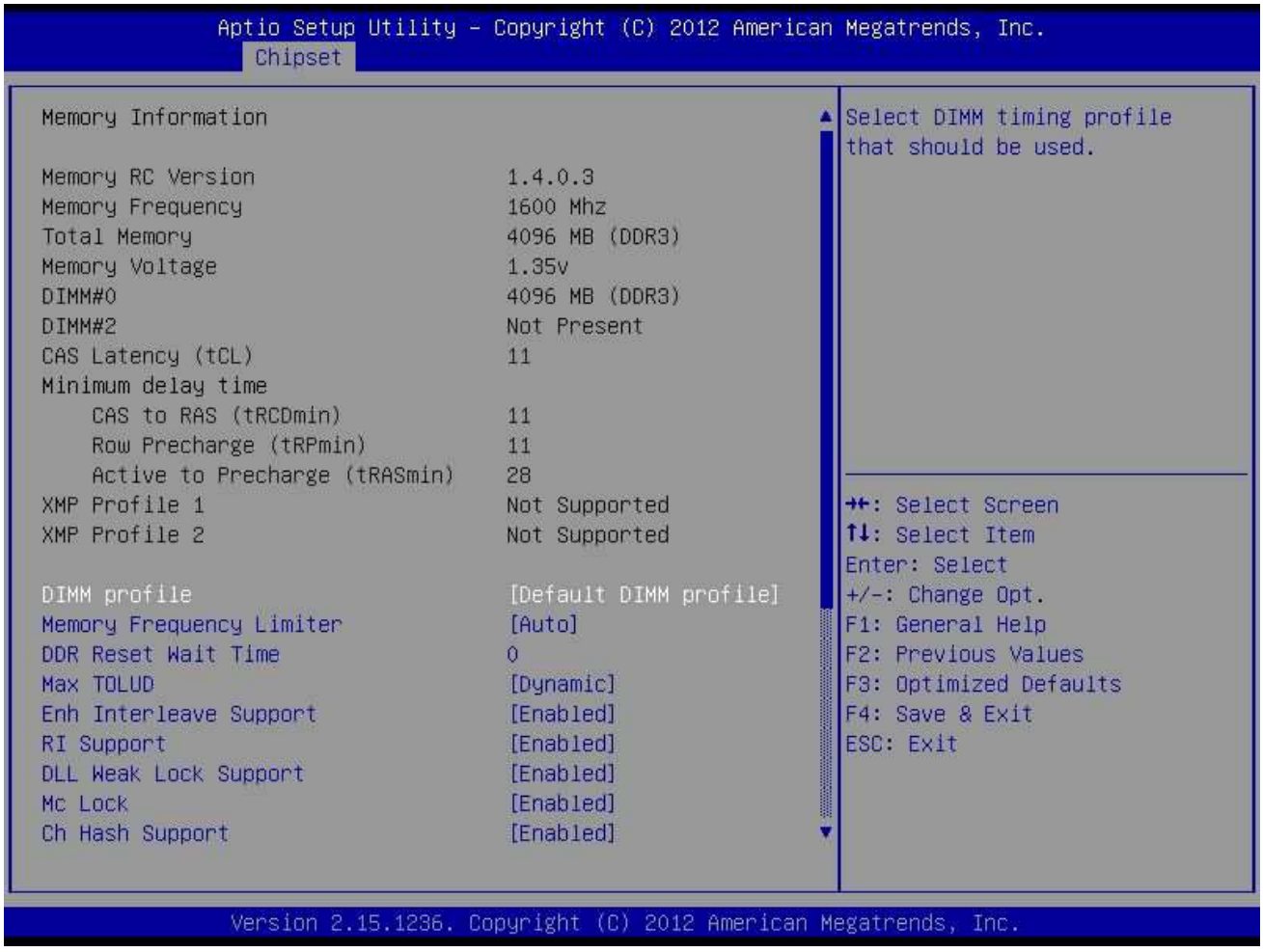

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
LCD Control
Primary IGFX Boot Display [VBIOS Default]
LCD Panel Type [VBIOS Default]
Spread Spectrum clock Chip [Off]
LVDS Function [Disabled]
Dual LVDS Mode [Dual Channel]
Panel Color Depth [24 Bit]
Backlight Control 90
Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

- 3.3.7 Chipset Menu

Memory Information

This item displays the current Memory Frequency, Memory Type and Memory Reference Code Revision.

Memory Frequency:
Description: This feature allows the user to select the memory speed. Under normal conditions, please set this to Auto.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
Memory Information
Memory RC Version 1.4.0.3
Memory Frequency 1600 Mhz
Total Memory 4096 MB (DDR3)
Memory Voltage 1.35v
DIMM#0 4096 MB (DDR3)
DIMM#2 Not Present
CAS Latency (tCL) 11
Minimum delay time
CAS to RAS (tRCDmin) 11
Row Precharge (tRPmin) 11
Active to Precharge (tRASmin) 28
XMP Profile 1 Not Supported
XMP Profile 2 Not Supported
DIMM profile [Default DIMM profile]
Memory Frequency Limiter [Auto]
DDR Reset Wait Time 0
Max TOLUD [Dynamic]
Enh Interleave Support [Enabled]
RI Support [Enabled]
DLL Weak Lock Support [Enabled]
Mc Lock [Enabled]
Ch Hash Support [Enabled]
Select DIMM timing profile that should be used.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

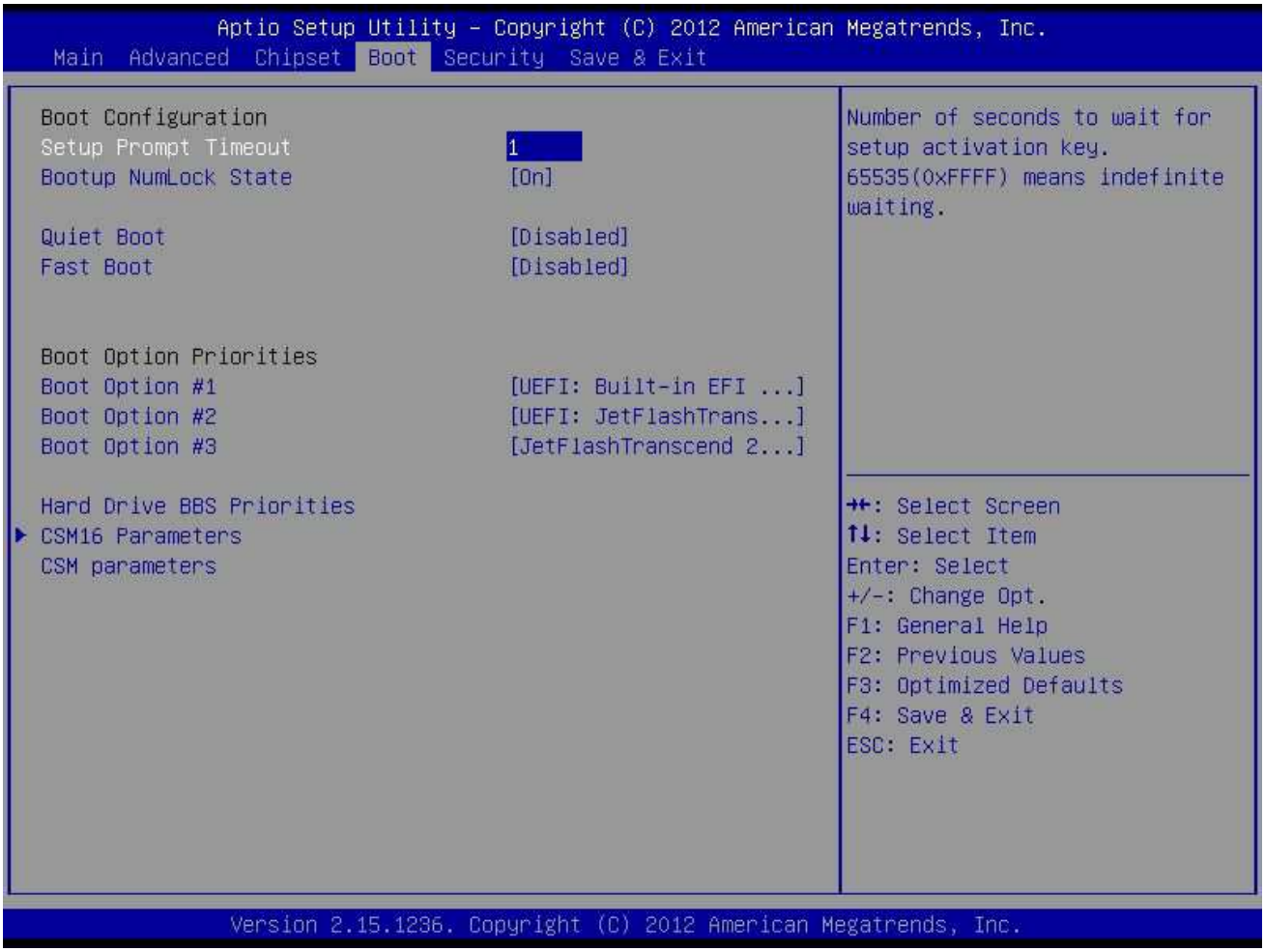
- 3.4 Boot Menu

Boot Configuration:

This feature allows the user to specify which devices are boot devices and the order of priority from which the systems boots from during startup.

Fast Boot:

This feature allows booting with initialization with a minimal set of devices required to launch an active boot option. The options are Disabled, and Enabled.



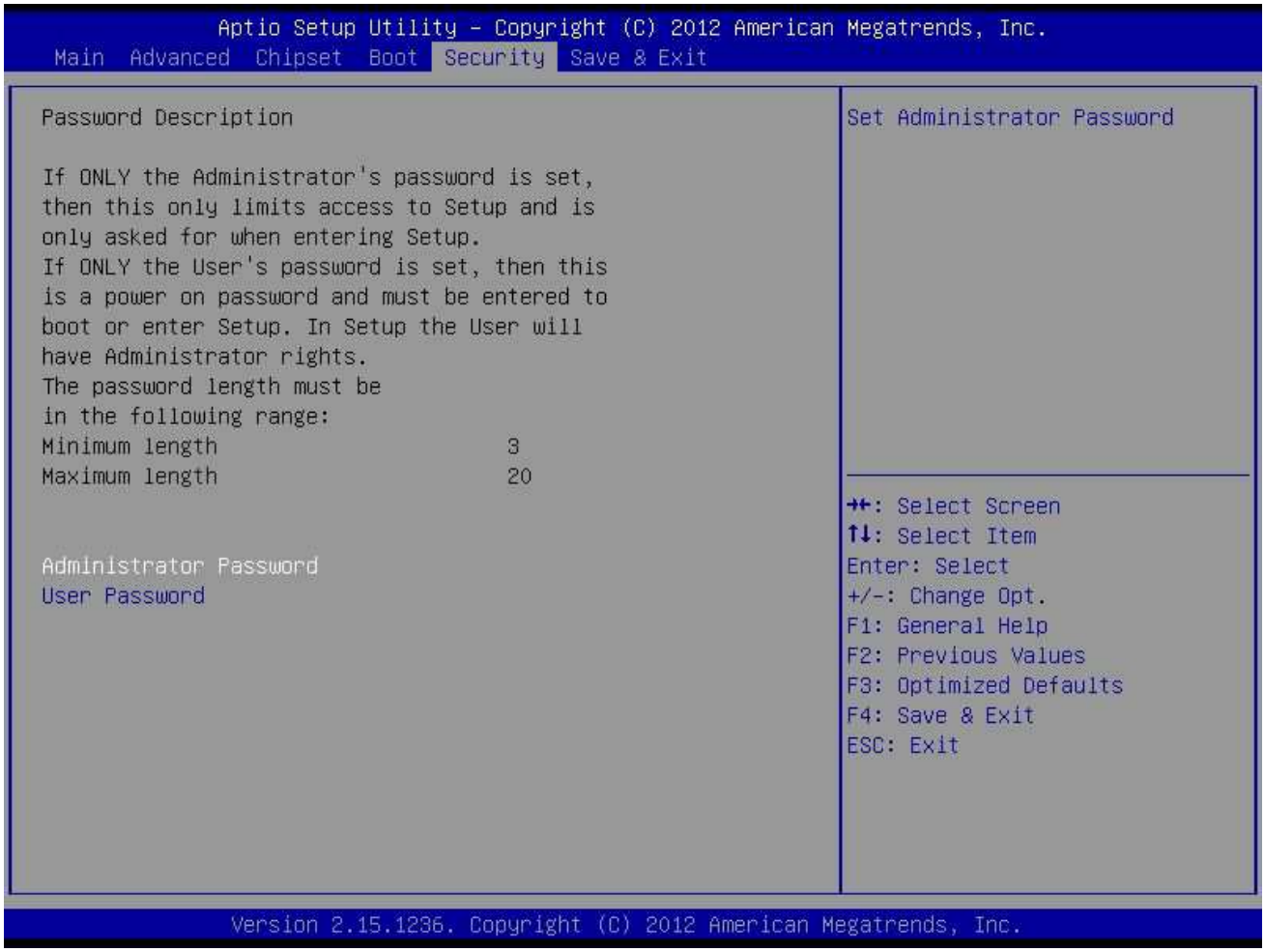
- 3.5 Security Menu

Password Description:

Description:

Administrator Password : Press Enter to create a new, or change an existing Administrator password.

User Password : Press Enter to create a new, or change an existing User password.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password length must be in the following range:
Minimum length 3
Maximum length 20
Administrator Password
User Password
Set Administrator Password
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

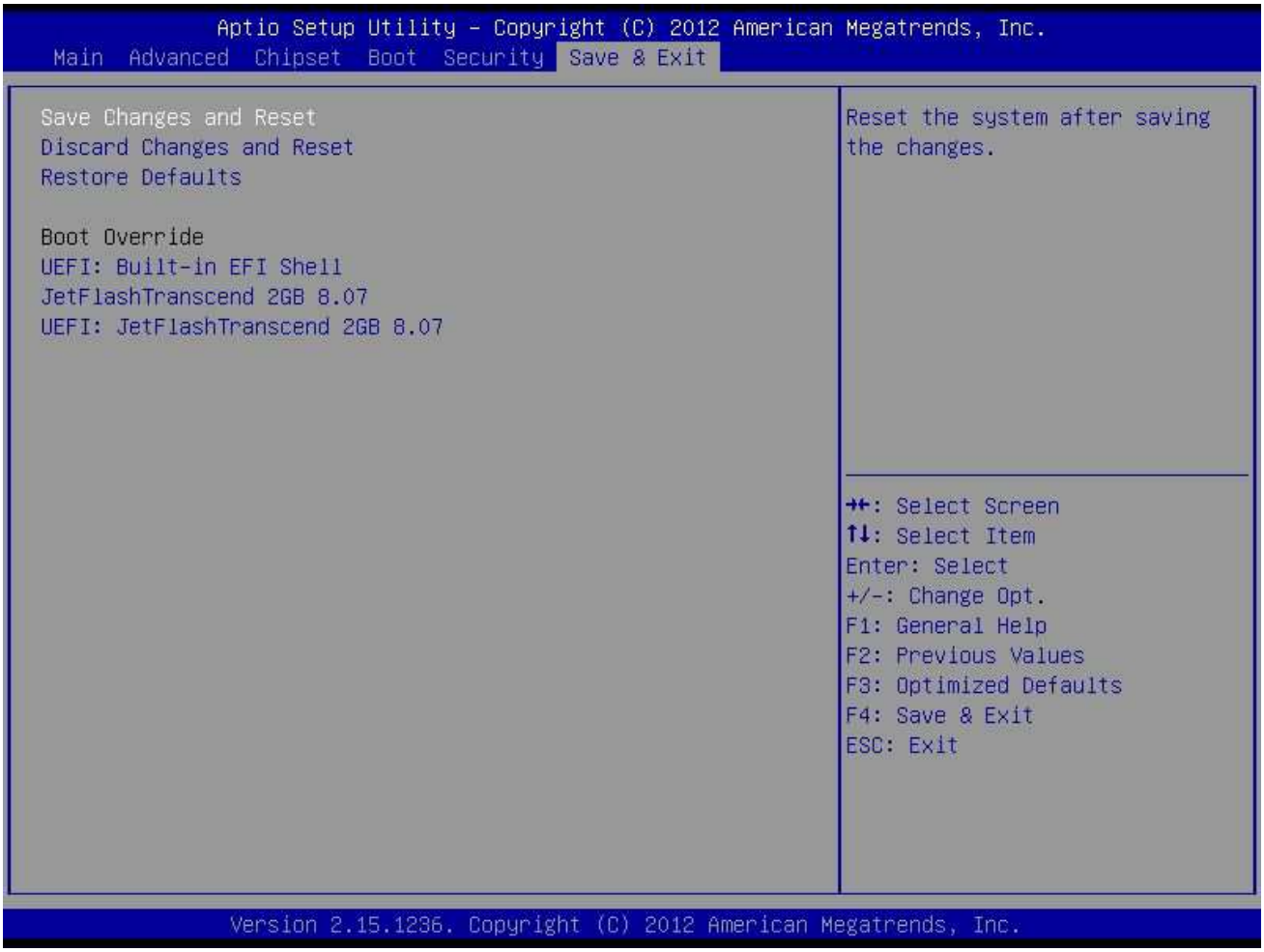
- 3.6 Save & Exit Menu

Description:

Save Change and Reset : When you have completed the system configuration changes, select this option to leave the BIOS Setup Utility and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>

Discard Changes and Reset : Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

Restored Defaults : To set this feature, select Restore Defaults from the Exit menu and press <Enter>. These are factory settings designed for maximum system stability, but not for maximum performance.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Save Changes and Reset
Discard Changes and Reset
Restore Defaults
Boot Override
UEFI: Built-in EFI Shell
JetFlashTranscend 2GB 8.07
UEFI: JetFlashTranscend 2GB 8.07
Reset the system after saving the changes.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

4.1 GPIO Sample Program for DOS environment

```
//AEWIN GPIO Program for MB-8301(DOS Version)
#include <stdio.h>
#include <dos.h>
#include <inlines/pc.h>

#define index_port 0x2E                    //Super IO Index Port Address
#define data_port   0x2F                   //Super IO Data Port Address

void Enter_sio_config();
void Exit_sio_config();
void help();

int main(int argc, char *argv[])
{
      int val, GPIO_SEL;

      if (argc!=2){
            help();
            return;
      }

      Enter_sio_config();
      if(strcmp(argv[1], "-r") == 0){
            printf("Read GP80~GP83\n");
            outportb(index_port, 0x8A);
            val = inportb(data_port);

            if ((val&0x01) == 0x00)
                  printf("GPI80 -> Low\n");
            else
                  printf("GPI80 -> High\n");

            if ((val&0x02) == 0x00)
                  printf("GPI81 -> Low\n");
```

```
        else
            printf("GPI81 -> High\n");

        if ((val&0x04) == 0x00)
            printf("GPI82 -> Low\n");
        else
            printf("GPI82 -> High\n");

        if ((val&0x08) == 0x00)
            printf("GPI83 -> Low\n");
        else
            printf("GPI83 -> High\n");
    }
    else if(strcmp(argv[1], "-84h") == 0){
        printf("(GPO84 High >> 3.3v)\n");
        GPIO_SEL = 0x10;
        outportb(index_port, 0x89);
        val = inportb(data_port)|GPIO_SEL;
        outportb(data_port, val);
    }
    else if(strcmp(argv[1], "-84l") == 0){
        printf("(GPO84 Low >> 0.0v)\n");
        GPIO_SEL = 0x10;
        outportb(index_port, 0x89);
        val = inportb(data_port)&(~GPIO_SEL);
        outportb(data_port, val);
    }

    else if(strcmp(argv[1], "-85h") == 0){
        printf("(GPO85 High >> 3.3v)\n");
        GPIO_SEL = 0x20;
        outportb(index_port, 0x89);
        val = inportb(data_port)|GPIO_SEL;
        outportb(data_port, val);
    }
    else if(strcmp(argv[1], "-85l") == 0){
        printf("(GPO85 Low >> 0.0v)\n");
```

```
        GPIO_SEL = 0x20;
        outportb(index_port, 0x89);
        val = inportb(data_port)&(~GPIO_SEL);
        outportb(data_port, val);
}

else if(strcmp(argv[1], "-86h") == 0){
        printf("(GPO86 High >> 3.3v)\n");
        GPIO_SEL = 0x40;
        outportb(index_port, 0x89);
        val = inportb(data_port)|GPIO_SEL;
        outportb(data_port, val);
}
else if(strcmp(argv[1], "-86l") == 0){
        printf("(GPO86 Low >> 0.0v)\n");
        GPIO_SEL = 0x40;
        outportb(index_port, 0x89);
        val = inportb(data_port)&(~GPIO_SEL);
        outportb(data_port, val);
}
else if(strcmp(argv[1], "-87h") == 0){
        printf("(GPO87 High >> 3.3v)\n");
        GPIO_SEL = 0x80;
        outportb(index_port, 0x89);
        val = inportb(data_port)|GPIO_SEL;
        outportb(data_port, val);
}
else if(strcmp(argv[1], "-87l") == 0){
        printf("(GPO87 Low >> 0.0v)\n");
        GPIO_SEL = 0x80;
        outportb(index_port, 0x89);
        val = inportb(data_port)&(~GPIO_SEL);
        outportb(data_port, val);
}
else{
        help();
}
```

```
	Exit_sio_config();
	return;
}

void help()
{
	printf("AEWIN GPI Program\n");
	printf("Usage:\n");
	printf("GPIO -r (Read F81866 GP80~GP83)\n");
	printf("GPIO -xh (x=84~87, and set GPx to high)\n");
	printf("GPIO -xl (x=84~87, and set GPx to low )\n");
	printf("ex:                                                    \n");
	printf("GPIO -84h (Set GP84 to high)\n");
}

void Enter_sio_config()
{
	outportb(index_port, 0x87);
	delay(1);                       //delay some time
	outportb(index_port, 0x87);
	outportb(index_port, 0x07);
	outportb(data_port,    0x06);
}

void Exit_sio_config()
{
	outportb(index_port, 0xAA);
}
```

4.2 Watchdog timer Sample Program for DOS environment

```
//AEWIN Watch dog program for MB-8301(Dos Version)
#include <stdio.h>
#include <string.h>
#include <dos.h>
#include <stdlib.h>
#include <inlines/pc.h>

#define index_port 0x2E                 //Super IO Index port address
#define data_port   0x2F                //Super IO Data port address

void Enter_sio_config();
void Exit_sio_config();
void help();

int main(int argc, char *argv[])
{
      int data_rw8, time;

            if (argc<2){
            help();
            return;
      }

            if(strcmp(argv[1], "-s") == 0){
                  //Show Watchdog Register Settings
            Enter_sio_config();
            outportb(index_port, 0xF5);
            data_rw8 = inportb(data_port)&0x08;
            if(data_rw8 == 0x00){
                  //second mode
                  outportb(index_port, 0xF6);
                  data_rw8 = inportb(data_port);
                  printf("Second mode: %d second\n", data_rw8);
            }
```

```
        else{
            //minute mode
            outportb(index_port, 0xF6);
            data_rw8 = inportb(data_port);
            printf("Minute mode: %d minute\n", data_rw8);
        }
        }
    else if(strcmp(argv[1], "-t") ==0 ){
        //Set Time-out Value
        if(argv[2] == NULL){
            help();
            return;
        }
        else{
            Enter_sio_config();
            outportb(index_port, 0xF6);
            outportb(data_port , 0x00);                    //Clear Status
            outportb(index_port, 0xF5);
            data_rw8 = 0x32;
            outportb(data_port, data_rw8);
                sscanf(argv[2], "%d", &time);
            outportb(index_port, 0xF6);
            outportb(data_port,    time);
            if(time==0){
                //Disable count
                outportb(index_port, 0xF5);
                data_rw8 = inportb(data_port)&0xCF;
                outportb(data_port , data_rw8);
            }
            else{
                outportb(index_port, 0xFA);
                outportb(data_port , 0x01);                //Enable reset function
            }
                printf("Watchdog Timer will count down for %d second(s)\n", time);
        }
    }
    else if(strcmp(argv[1], "-m") ==0 ){
```

```
        //Set Time-out Value
        if(argv[2] == NULL){
            help();
            return;
        }
        else{
            Enter_sio_config();
            outportb(index_port, 0xF6);
            outportb(data_port , 0x00);                    //Clear Status
            outportb(index_port, 0xF5);
            data_rw8 = 0x32;
            data_rw8 |= 0x08;
            outportb(data_port, data_rw8);
                sscanf(argv[2], "%d", &time);
            outportb(index_port, 0xF6);
            outportb(data_port,    time);
            if(time==0){
                //Disable count
                outportb(index_port, 0xF5);
                data_rw8 = inportb(data_port)&0xCF;
                outportb(data_port , data_rw8);
            }
            else{
                outportb(index_port, 0xFA);
                outportb(data_port , 0x01);                //Enable reset function
            }
                printf("Watchdog Timer will count down for %d minute(s)\n", time);
        }
    }
    Exit_sio_config();
    return;
}

void Enter_sio_config()                        //Enter W83627EHF Configuration
{
    outportb(index_port, 0x87);
    delay(1);                          //Delay some time
```

```
    outportb(index_port, 0x87);
    outportb(index_port, 0x07);          //Super IO Selct Bank Register Number
    outportb(data_port , 0x07);          //Select logical device 7
}

void Exit_sio_config()                   //Exit W83627EHF Configuration
{
    outportb(index_port, 0xAA);
}

void help()
{
    printf("AEWIN Watchdog Timer Program\n");
    printf("Usage: WDT -s        (Show Watchdog Register Settings)\n");
    printf("Usage: WDT -t xxx (Set Time-out Value)\n");
    printf("                xxx = 1 ~ 255 seconds\n");
    printf("                xxx = 0 : Time-out Disable \n");
    printf("Usage: WDT -m xxx (Set Time-out Value)\n");
    printf("                xxx = 1 ~ 255 minutes\n");
    printf("                xxx = 0 : Time-out Disable \n");
}
```

Device Resources